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INDIANAPOLIS, INDIANA.  
**REPORTS**

OF THE

**TREASURER OF STATE.**

DECEMBER 10, 1835.

Read and referred to the Committee of Ways and Means and 500 copies ordered to be printed for the House of Representatives.

HON. CALEB B. SMITH,  
*Speaker of the House of Representatives:*

Herewith are transmitted to be laid before the House;

1st. The Treasurer's report of the general state of the Treasury.

2nd. The Loan Office Report—Statement A, presenting the operations of that department in reference to the College Fund—Statement B, the Indianapolis Fund; and Statement C the Saline Fund.

3d. The list of the borrowers of the College Fund—of the Indianapolis Fund, and of the Saline Fund.

4th. The items of the Contingent Expenses.

5th. A bill of the purchase and cost of Stationary.

N. B. PALMER,  
*Treasurer of State.*

*Treasurer's Office, 9th Dec. 1835.*

TREASURY DEPARTMENT,  
*Indianapolis, 9th Dec. 1835.*

The Treasurer of State, in obedience to the directions of the "Act concerning the Auditor of public accounts and Treasurer of State," submits the following Report of the Revenue and Expenditures of the State, and the operations of the Loan office, &c., from the 1st of December, 1834, to the 1st Dec. 1835.

## No. 1.

There was a balance remaining in the Treasury at the close of the last financial year, of			\$2,324 14
Receipts during the fiscal year from revenue of			
	1831	\$7 10	
"	"	1832	77 76
"	"	1833	103 49
"	"	1834	44,348 78
			<hr/>
Rents paid by superintendants of State Prison			44,537 13
From sale of Michigan Road Lands			700 00
" " Lots, &c., at Indianapolis			10,876 86
Loans of Indianapolis Fund refunded			10,111 14
Interest on loans of Indianapolis Fund			16,657 51
Estates without heirs			2,059 66
Monies refunded			34 03
Congressional townships			10 00
The receipts in the College branch of the Loan office department have been, from Wm. Alexander, commissioner of Reserve township, in Monroe		1,804 36	
James Smith " Gibson		2,653 33	
Loans refunded.		8,833 37	
Interest on loans		2,518 19	
Sale of mortgaged lands of John Berry		500 00	
			<hr/>
			16,359 25
The amount paid into the Treasury, of Saline Fund, appertaining to the Loan office, has been, from Henry Young, commissioner of Saline lands in Washington county			
		592 56	
" Andrew Wilson com'r. in Orange co.		3,809 87	
" Loans refunded		500 00	
" Interest on loans		682 47	
" Rents Salt Lick Reserves		234 12	
			<hr/>
			5,819 02
			<hr/>
			<u>\$110,038 77</u>

## THE EXPENDITURES DURING THE SAME PERIOD HAVE BEEN,

Pay and mileage of members of the Legislature, including Clerks, Door-keepers, &c.	\$19,194 72
Printing and Stationary	5,542 99
Specific appropriations	2,621 05
Contingent expenses	774 45
Premium on wolf scalps	606 50
Pay of Probate judges	2,475 00
" Executive officers	1,800 00
" Judges of Supreme and Circuit Courts	7,108 83



Pay of Circuit Prosecutors	1,144	29	
" Adjutant and Quarter-master Generals	87	10	
Payments on account of State house	26,131	74	
" " State Prison	3,085	01	
" " " Library	200	00	
" " Seat of Government	312	00	
			<hr/>
			\$71,083 68
Loans of Indianapolis Fund			2,908 35
Michigan Road scrip redeemed			10,051 86
Treasury notes burnt			27 00
Conscientious fines distributed			9 00
Michigan road			1,227 37
The disbursements on account of the College branch of Loan office, have been, Indiana College, including incidental expenses of Loan office	2,930	08	
Loans of College fund	10,205	00	
			<hr/>
			13,135 08
Payments on ac't. of Saline side of Loan office:			
Amount of loans	5,457	50	
" Specific appropriations		1 62	
			<hr/>
			5,459 12
" Cash on hand, Dec. 1st, 1835			6,137 31
			<hr/>
			<u>\$110,038 77</u>

The available means of the Treasury, for the ensuing year, may be estimated as follows:

Cash on hand 1st Dec. 1835	\$6,137 31
The revenue of 1835 to be paid subsequently to 30th Nov. 1835	50,000 00
Amount to be reimbursed from Indianapolis fund	6,000 00
Rent from superintendant of State Prison	700 00
	<hr/>
	<u>\$62,837 31</u>

The expenses of the year may be estimated as follows:

Salaries of Judges and Prosecutors	\$9,000 00
Executive officers	2,600 00
Printing, Stationary, distributing laws, &c.	5,000 00
Legislature	22,500 00
Contingent and specific appropriations	2,500 00
Probate judges	2,500 00
Wolf scalps	700 00
State Prison	3,000 00
State Library	200 00
Adjutant and Quarter-master Generals	150 00

The Treasury is liable to the following existing claims:

Salaries and other claims not audited	2,000 00
College fund in the Treasury	4,891 81
Saline Fund	582 44
Amount required to meet the cost of the Fire	
Engine, house, &c.	1,200 00
Militia fines to be distributed	510 40
	<hr/> \$57,334 65

Leaving a balance in the Treasury, Dec. 1, 1836, of 5,502 66

The unusual promptness which attends the collection and payment into the treasury, of the public revenue, affords satisfactory evidence of the efficiency of our revenue laws, so far as regards the operation of collection; but there is reason to believe that the assessments are, in many instances, greatly deficient in uniformity, and otherwise partial and imperfect in their character.

The just claim of the people to a fair and equal distribution of the burthens of taxation, as well as the interest of the treasury, would seem to require such legislative aid as will ensure a greater degree of perfection and uniformity in the assessments.

The gradual increase in our revenue, thus far, is equal to the growing expenses of the State, and will, it is presumed, under the present order of things, continue to be adequate to the ordinary expenses of the government. But should the legislature deem it expedient to adopt a liberal system, in reference to internal improvements, and such adequate compensation to public servants as may correspond with the enhanced value of every species of property, such change will be required in the revenue laws, as will be productive of a revenue considerably above that now realized.

The fund arising from the sale of lots at Indianapolis, which has been specially set apart for the erection of the State house, will be found inadequate to the completion of that edifice and its appendages by an amount of from ten to fifteen thousand dollars. This deficiency may be supplied by a sale of the lots, and some of the public grounds yet remaining unsold, should the General Assembly deem it expedient to order their sale. The disbursements from the treasury, on account of the State house, have already anticipated that fund to the amount of \$6,000. Under the expectation that this sum would be reimbursed to the treasury, by the sale of some of the public grounds, I have carried that amount into the estimates for the treasury the coming year.

It has not been found necessary to negotiate the loan authorized to be made by the Treasurer of State, by the act of last session of the General Assembly. Although the treasury has been somewhat straightened on account of the heavy expenses of the State house, yet by a prudent use of the authority given the treasurer, by a former act of the General Assembly, to use for the purpose of the State house, any funds in the treasury, the operations of the treasury have not been materially embarrassed on account of a forbearance to make the loan authorized to be negotiated.

The law establishing the Loan Office, has shown by its practical operation, to be admirably adapted to the productiveness and security of the funds authorized to be loaned.

The forms directed to be forwarded by the Treasurer of State to the school commissioners in the respective counties, were prepared and forwarded in April last, but as the period has not yet arrived when the school commissioners are required to make their returns for the present year, I am not able at this time to communicate to the General Assembly, the extent of benefit which may result from the act in question.

It will be discovered by the table of Receipts into the treasury the present year, that the sum of \$550 has been deposited by Congressional townships through the school commissioners, under the provisions of the 38th section of the "act incorporating Congressional townships, and providing for public schools therein," approved February 2d, 1833. The act provides that the proper township shall be entitled to draw from the State treasury, on the first of January in each year, the interest on the sum deposited, at a rate not less than 6 per cent. As there is no authority under existing law for loaning this fund, I have thought it my duty respectfully to suggest whether, (as the State is bound to pay the interest annually,) the money should not be authorized to be loaned upon the same principles of the College fund.

The duties assigned to the treasurer of State in reference to the purchase of a Fire Engine, the insurance of the State house, &c. have been performed as far as circumstances would permit; a detailed statement of which will be communicated to the Legislature in a few days.

All which is respectfully submitted.

N. B. PALMER,  
*Treasurer of State.*

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(No. 2.)

**Statement A--College Fund.**

*Report of the operations of the College Fund, from the 1st of December, 1834, to the 30th November, 1835.*

**RECEIPTS.**

Cash on hand at last report	\$1,667 64
Received from James Smith, commissioner Reserved township, in Gibson county	2,653 33
“ from Wm. Alexander, commissioner, Monroe county	1,804 36
“ Loans refunded	8,883 37
“ from sale of mortgaged land of John Berry	500 00
“ from interest on loans	2,518 19
	<hr/> \$18,026 89

**CONTRA.**

Amount of loans as per list accompanying	\$10,205 00
State Seminary, including college expenses	2,930 08
Cash on hand	4,891 81
	<hr/>
	\$18,026 88
	<hr/>

**[No. 2.]****Statement B--Indianapolis Fund.**

The amount of this fund paid into the Treasury prior to the 30th November, 1834, including interest on loans	\$65,852 40
There has been paid by the Agent for Indianapolis, the present year	10,111 14
	<hr/>
	\$75,963 54
The payments from this fund under head of Seat of Government	27,419 38
On account of State house	54,840 30
	<hr/>
	82,259 68
Showing a disbursement predicated upon this fund over the amount paid into the treasury, of	6,296 14
The probable amount yet to be paid to the contractors of the State house and others, including expenses of furniture and other appendages, may be estimated at	10,000 00
To which add the amount above, as overpaid from the treasury, and expected to be reimbursed	6,296 14
	<hr/>
	16,296 14
The amount yet to be paid by the agent, including sums not yet due on lots sold, may be estimated at	5,000 00
Leaving this amount to be provided for by the legislature by sale of lots or otherwise	<hr/>
	11,296 14
	<hr/>



## (No. 2.)

**Statement C--Saline Fund.**

*Report of the operations of the Saline Fund from the 1st of December, 1834, to the 30th November, 1825.*

**RECEIPTS.**

Cash on hand 1st December, 1834	\$222 54
Received from Henry Young, commissioner of Saline lands in Washington county	592 56
“ from Andrew Wilson, commissioner of Saline lands of Orange county	3,809 87
Loans refunded	500 00
Interest on loans	682 47
Rents Salt Licks	234 12
	<hr/>
	<u>\$6,041 56</u>

**CONTRA.**

Amount of loans as per list accompanying	5,457 50
Saline fund	1 62
Cash on hand	582 44
	<hr/>
	<u>\$6,041 56</u>

## [No. 3.]

*List of Borrowers of College Fund.*

Jonathan Flener	-	-	-	-	-	\$100 00
Hiram Bacon	-	-	-	-	-	300 00
Brazilia French	-	-	-	-	-	150 00
Zadock Smith	-	-	-	-	-	350 00
William Logan	-	-	-	-	-	300 00
George C. Brightman	-	-	-	-	-	250 00
Samuel J. Patterson	-	-	-	-	-	500 00
Samuel Chambers	-	-	-	-	-	110 00
James Snow	-	-	-	-	-	150 00
Lewis Mastin	-	-	-	-	-	300 08
John Ritchey	-	-	-	-	-	125 00
Sidney Williams	-	-	-	-	-	200 00
Joshua Hinesly	-	-	-	-	-	400 00
John M. Smith	-	-	-	-	-	500 00
Wyatt Harris	-	-	-	-	-	150 00

Leonard Woolins	-	-	-	-	200 00
Francis Holland	-	-	-	-	200 00
Hardrass Hawkins	-	-	-	-	250 00
Thomas Bell	-	-	-	-	200 00
Lewis Neff	-	-	-	-	500 00
John Simpson	-	-	-	-	150 00
John E. McCleur	-	-	-	-	350 00
William W. Miller	-	-	-	-	150 00
George Vanlandingham	-	-	-	-	150 00
Gliden True	-	-	-	-	320 00
William Goodrich	-	-	-	-	300 00
Mark Harris	-	-	-	-	50 00
Silas Andrus	-	-	-	-	150 00
Henry Shetterly	-	-	-	-	200 00
Philip Dean	-	-	-	-	100 00
John Snodgrass	-	-	-	-	100 00
James B. Hart	-	-	-	-	300 00
Jacob Shank	-	-	-	-	200 00
John Fisher	-	-	-	-	100 00
Benjamin R. Smith	-	-	-	-	150 00
Joseph Miller	-	-	-	-	200 00
Zachariah R. Clark	-	-	-	-	100 00
Moses Crawford	-	-	-	-	500 00
John Milroy	-	-	-	-	500 00
John F. Arnold	-	-	-	-	150 00
John Fisher	-	-	-	-	150 00
John Allen	-	-	-	-	100 00
Morris Pierson	-	-	-	-	500 00

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\$10,205 00

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(No. 3.)

*List of Borrowers of the State House Fund.*

Samuel Merrill	-	-	-	-	\$500 00
John Cain	-	-	-	-	150 00
Archibald C. Reid	-	-	-	-	400 00
Edward Heizer	-	-	-	-	50 00
Samuel Newbury	-	-	-	-	400 00
Henry Brady	-	-	-	-	100 00
James Blake & Co.	-	-	-	-	1,308 35

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\$2,908 35

*List of Borrowers of the Saline Fund.*

Jacob Derringer	\$200 00
Francis M. Richmond	500 00
Reubin Joy	500 00
Joseph Way	500 00
Garrad Spurrier	100 00
Mark Harris	250 00
Nathaniel Richmond	280 00
John W. Alley	130 00
Daniel Stuck	100 00
William Wallace	200 00
Joseph Chapman	500 00
John Allison	250 00
Isom Garrett	200 00
Jeremiah Meek	275 00
George Teague	350 00
Jacob Jones	262 50
Henry Harmon	100 00
James Crow	70 00
William Triggs	60 00
B. Higdon	100 00
John Triggs	130 00
J. F. Boyd	300 00
Isam Garrett	100 00

**\$5,457 50**

**[No. 4.]**

*Contingent Expenses from 1st December, 1834, to 30th November, 1835.*

Paid Abner Frazier for procuring an axe for General Assembly, and repairing fence around Governor's circle	\$1 87
" Table for Secretary's office	5 50
" Window glass, &c. for Governor's house	10 00
" H. F. Feeney for transportation of arms	122 50
" John Jenison for furnishing Blank books and binding	12 75
" J. F. D. Lanier for procuring testimony in the Saline land suit in Dearborn county	20 00
" Indian Chiefs of the Pottawatamies, on the Govr's order	10 00
" John Cain for Postage	40 15
" J. H. Lane & Co. for storage of arms	46 61
" H. F. Feeny for transportation of arms	20 00
" Andrew Hoover for transportation of arms from Cincinnati to South Bend, St. Joseph county	30 00
" J. Edgar for repairs on Governor's circle	50

Paid E. W. Dunbar for stationary furnished Secy's office	\$1 62
" " " " Legislature	26 68
" D. J. Caswell for his services and expenses in attend-	
ing Saline land suit in Dearborn county	35 00
" J. L. Ketcham as Private Secretary to Governor	50 00
" John Cain for postage	78 70
" J. F. D. Lanier for his services and expenses in attend-	
ing Saline land suit in Dearborn county	32 75
" W. E. Dunbar for stationary furnished Auditor's office	4 62
" John Cain for postage	80 90
" Joseph Russel for transportation of arms	30 00
" John Sering for storage of arms	6 00
" Joseph Russel for transportation of arms	15 62
" John Cain for postage	78 31
" Wm. Sheets for forwarding Blackford's Reports to oth-	
er states, and procuring wood on Governor's order	14 37
	<u>\$774 45</u>

## [No. 5.]

*Amount paid by the Treasurer for Stationary, Carriage, &c., from Decem-  
ber 1st, 1834, to November 3d, 1835.*

May 8th—Bought of Josiah Drake,

2 reams Gilpin's fine post	\$5 00	\$10 00
3 " Ames' " "	4 50	13 50
3 " Gilpin's white	4 00	12 00
2 " Ames' fine white	5 50	11 00
3,000 quills	6 50	19 50
3,000 "	7 50	22 50
2,000 "	2 00	4 00
10 lb. wafers	1 00	10 00
8 doz. inkstands		6 00
4 " sand boxes		3 00
1 " brass snuffers		2 75
1 " pair brass candlesticks		3 75
14 " ribbon		4 50
1 " ink powder		1 00
2 " " "		3 00
2 quires blotting paper		75
2 doz. tape		2 00
1 5-12 doz. tape		32
2 boxes and shipping		2 00



<b>May 13—Bought of George Conclin:</b>		
10½ lbs. wafers		\$11 87
1 ream ruled post		4 50
2 doz. pens		75
1 letter stamp		38
<b>Oct. 12—Bought of Leeds &amp; Jones:</b>		
67 reams post		251 25
3 " fine mingled (colored)		12 75
carriage		5 95
" 26—Bought of Josiah Drake, 12 dozen sand		12 00
carriage		2 25
<b>January 12—Paid James Brandon, transportation</b>		<b>27 30</b>
<b>August—Carriage, specimen paper</b>		<b>50</b>
<b>November 9—Paid John Wildman, transportation</b>		<b>23 50</b>
<b>Expenses of purchase, &amp;c.</b>		<b>20 00</b>
		<hr/>
		<b>\$504 57</b>

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REPORT

OF

A. GARDNER,

COMMISSIONER OF THE WABASH RIVER.

DECEMBER 11, 1835.

Read and referred to select committee on Canals and Internal Improvements.

*To to the Honorable,  
the General Assembly of the State of Indiana:*

The undersigned, Commissioner of the fund appropriated by the State of Indiana, for the improvement of the navigation of the Wabash river, respectfully begs leave to submit the following Report of his proceedings had under the act creating his appointment, during the past year.

In my last annual report to the Legislature, I stated that all the principal obstructions below the Grand Rapids had been definitely surveyed; and that plans and estimates of the cost of the work proposed to be done had been made, preparatory to placing these jobs under contract; and that the survey, plans, and estimates of the obstructions at and above the Grand Rapids, were progressing, and that the result would be reported. The examination and surveys made in the fall and winter of 1834, were, for the want of time, unavoidably confined to the principal and formidable obstructions to steam boat navigation, and the result of these surveys is contained in the report of the Engineer; a copy of which report marked A, is herewith submitted. During the low stage of water the present fall the undersigned, with the assistance of the Engineer employed on the river, proceeded to make an examination and survey of all the obstructions which present considerable barriers to the ordinary navigation, along the whole of that part of the river over which the two states have concurrent jurisdiction, and which obstructions and barriers were not previously examined

for reasons above stated. These latter obstructions consist of sand and gravel bars, snags and sunken logs, and one rock bar called "Warrick's Ripple," which occurs a few miles above the "Grand Chain."

The whole number of snags and sunken logs which are considered dangerous impediments to the navigation, is 265, all of which have been noticed and designated on a plan of the river, in order that they may be described and identified whenever it shall be deemed expedient to place the removal of the whole or any portion of them under contract. These snags and sunken logs are the principal obstructions which render the navigation hazardous, and a large portion of the accidents which have happened, and of the consequent loss of property has been occasioned by them.

From experiments made on the river, the present season, it has been found that the difficulty and expense of removing the snags and sunken logs have most generally been overrated in public opinion; and a belief that this would prove to be the fact was sufficient to induce the commissioners to defer entering into contracts for this description of work to any great extent until the matter in question should be tested by actual operations. It is now believed that the sum of 4000 dollars would defray the expenses of removing all the snags and sunken logs in the way of the navigation.

The sand and gravel bars have been accurately examined, and the minutes of the examination and surveys will be presented as data upon which to base plans and estimates of costs, for their improvement, whenever it may become expedient and practicable to perform the work.

The number of the sand and gravel bars, which had less than three feet water upon them, in the channel, at the time of the examination, is nineteen. Three of the whole number had less than two feet, and none less than 20 inches depth of water. Those bars which had the shoalest water, upon them, consisted of soft and shifting sand; and it is not difficult to force temporary channels through them for the passage of crafts, drawing more than the actual depth of water on the bar. On the whole, it may be safely assumed that the sand and gravel bars do not present any considerable barrier to the navigation conducted by competent pilots, except in extreme low water; and that the river from the mouth to the state line, where the rock obstructions and snags are removed or overcome, can be navigated by steam boats, properly adapted to the river, for the space of ten months in the year. It is proper to remark, however, that there are two sand bars near the mouth of the river that cause delays to the navigation at times of extreme low water in the Ohio, even if the Wabash should be in good boating stage above them.

"Warrick's Ripple" is a rock bar, composed of large detached fragments or boulders of rock, with a crooked and difficult channel through them, but like the sand bars, is in the way of the navigation only during the low stages of water. It is estimated that the sum of one thousand dollars would be sufficient to defray the cost of excavating and clearing out a good and sufficient channel at this place.



By the act passed at the last session of the Legislature I was authorized and required to procure by purchase or donation, such parcels of land and contiguous to the proposed improvements on the river as would be suitable and necessary for the use of the works to be constructed.

In relation to this subject I beg leave to report, that the works which have been prosecuted the present season required no land to be procured within the jurisdiction of this state. The proposed improvements at the Grand rapids, and at the other obstructions above them, not having been finally located, I have been unable to determine the precise locality of the land that would be most suitable and necessary for the object contemplated by the act, and have, therefore, deferred the selection.

In discharge of the duty defined in the 6th section of the act under which I hold my appointment, I have co-operated with the commissioner appointed by the state of Illinois, in placing under contract, in the manner prescribed by the law of this state, the removal of the obstructions to the navigation, at such places as most required it, and which the nature of the obstructions considered, with the amount of funds to be expended, and a compliance with the laws of both states rendered practicable. By reference to the laws of both states, it was found that the funds of Illinois were available and applicable to the improvement of the navigation only in conjunction with those of Indiana—that the commissioner on the part of Illinois was restricted and required to commence the improvement at the obstructions near the mouth of the river, and then continue his operations upwards—that the subsequent law of Indiana made it the express duty of its commissioner to co-operate with the commissioner on the part of Illinois, and that the general tenor of the last mentioned law, contemplated an union of effort on the part of both states to effect the object in view. It was therefore agreed, between the commissioner of Illinois and the undersigned to confine their joint operations to the following most formidable obstructions nearest the mouth of the river, viz: *Black's Cutoff, The Little Chain, The Grand Chain, Coffee Island Rapids, and the White River Rapids*. By this arrangement, the requisitions of the laws of both states would be complied with, and in effect, nearly or quite the whole amount of the appropriation of this state would be applicable to the next principal obstructions, the Grand Rapids.

The contracts for executing the works at the places above named, were let at Vincennes, in the month of May last. The amount at which the jobs were taken, exceeded the estimates about nine per cent., but in view of the excitement which existed at the time, on the subject of the scarcity and high prices of provisions, on the Wabash, and of the consequent advance in the price of labor, the letting was deemed favorable to the interests of the states.

The contracts for the work to be performed at Black's Cutoff, the Grand Chain, and Coffee Island Rapids have been efficiently prosecuted. The first contract for the work at White River Rapids being abandoned, this job was re-let in the month of September, since which time the last contractors have efficiently prosecuted the work.

The contract for the work at the Little Chain was taken by the same company who contracted for the Grand Chain, and owing to high water could not be prosecuted until a period this fall, which was too late for the commissioners to declare the job abandoned, and re-let it the present season. The work was not commenced by the contractors, and it remains discretionary with the commissioners whether the contract shall continue to be binding on them or not.

The sum of eleven hundred and ninety-two dollars and fifty cents has been expended on the contract at Black's Cutoff, in removing dangerous snags and sunken logs, and in clearing the banks of standing timber liable to fall into the stream and produce new obstructions. This amount of work was considered sufficient to afford a safe channel through the Cutoff, and perhaps no expenditure of equal amount could have been made, which would have so much lessened the dangers of the navigation, or have tended to remove unfavorable impressions, as to the difficulties of navigating the river generally, and consequently to reduce the costs of insurance and pilotage.

The works at the Grand Chain, notwithstanding the continued high water during the latter part of spring and summer, have been successfully prosecuted, and would have been completed the present fall and winter, but for the present high freshet in the river. The work, however, is so far progressed in, as to be of essential benefit to the navigation during the ensuing boating season, and the failure to complete the job is to be regretted, mainly on account of the interests of the contractors.

The job at Coffee Island Rapids, consisting chiefly of the excavations of a channel through the rock bar, and requiring the lowest stage of water, and moderate weather, in which to perform this part of the work, could not be fully completed the present season.

The work so far as progressed in, adds materially to the safety and facility of the navigation, at all stages of water, and its utility will be felt, in the event of a low and difficult stage of the water during the approaching season of navigation.

The completion of the contract at the White River Rapids has likewise been prevented in consequence of the present high freshet in the river. Very little work, however, remains to be done at this place, and nearly the full benefit of the work will be felt, in the present unfinished state of the works.

The forgoing contracts, when fully completed, will amount to about the sum of nine thousand dollars, and the amount of commissions, expenses of surveys, and examinations, mathematical instruments, superintendence, and other incidental expenses, up to the date of this report, will be about eighteen hundred dollars. From this estimate, it will appear, that there will remain of the joint fund of both states, about thirteen thousand dollars to be applied to future contracts and operations on the river.

The following statement will exhibit the amount of funds received



and disbursed by the undersigned, and the balance remaining in his hands, up to the date of this report, viz:

Amount received from Canal Fund Commissioner, as stated in the last annual report, is	\$5,156 73
Deduct amount of disbursements, stated in last report	213 74
Balance	\$4,942 99
Amount received of B. I. Blythe, Esq., Agent of the 3 per cent. Fund, January, 1835	7000 00
Total	11,942 99

Out of which amount of funds received, the undersigned has made the following disbursements, up to the date of this report inclusive, viz:

Cash paid Edward Smith for services as Engineer, and for stationary	\$272 00
Cash paid for advertising notices for contractors	41 87½
Cash paid Secretary of State for certified copy of law	4 00
Cash paid at sundry times to Nance & Johnson, contractors at the Grand Chain	642 14
Cash paid Scott & Westfall, contractors at Black's Cutoff in full of contract	1,074 00
Cash paid Seneca Almy, Esq., for services superintending contract at Black's Cutoff	118 50
Cash paid Beall, and Bagwell, and Jones, contractors at Coffee Island Rapids, on account	400 00
Cash paid Beall, Bagwell, and Smith, contractors at White River Rapids	1,087 80
Cash paid self, for 127 days services, at \$2	254 00
“ “ travelling expenses and postage account	64 06½
	\$3,958 38

Leaving a balance of funds in the hands of the undersigned, on the 28th day of November, 1835, of seven thousand nine hundred and eighty-four dollars and sixty-one cents.

The time in which the undersigned has been actually engaged in the discharge of his duties, from the 28th day of November, 1834, to the 28th November, 1835, is one hundred and twenty-seven days.

All which is respectfully submitted, ANDREW GARDNER.  
Dated Vincennes, November 28, 1835.

State of Indiana, }  
Knox county, } ss.

Before the undersigned, a Justice of the Peace in and for said county, personally came Andrew Gardner, who made oath that the foregoing Report is substantially correct, to the best of his knowledge and belief. In witness whereof I have hereunto set my hand and seal at Vincennes, the 1st day of December 1835. MARTIN ROBINSON, J. P.

# SENATE.

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## REPORT

OF THE

## PRESIDENT OF THE STATE BANK.

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DECEMBER 12, 1835.

Read, 500 copies ordered to be printed, and referred to Committee on the State Bank with two reports accompanying.

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*To the General Assembly of the State of Indiana.*

Since the last annual report of the Directors of the State Bank, they proceeded in compliance with the law in that respect to provide for organizing the branch for the eleventh district. Fort Wayne was selected for its location, the necessary stock has been subscribed, the first instalment paid over, and banking operations commenced there, the 25th November.

The loan of \$450,000, for the second instalment in the ten branches, and the first in the Fort Wayne branch was negotiated by the Canal Fund Commissioners, in August last, at a premium of four and a half per cent. The instalments due from the State amounting to \$200,000, were paid over to the several branches on the 10th November, and \$114,826 87 cents was loaned to individual stockholders to pay their second instalment, on their mortgaging, to the State, lands valued at double the amount clear of perishable improvements. The sum of \$134,951 87 due on the second instalment in the ten branches, was paid by the stockholders in specie. Such of the loan as was not bor-

rowed by the stockholders, and the premium upon it has been paid to the Commissioners of the Sinking Fund.

The capital paid in all the branches is now \$1,280,000, except \$221 35 of second instalment yet unpaid by individual stockholders. After paying the expenses of organizing and managing the Bank and branches, and making a reservation of \$36,179 35 for the surplus fund, a dividend of three per cent. on the capital paid in, was declared at the November session of the State Board. The sum of \$15,000 accruing to the State, has been paid over to the Sinking Fund, and \$2000, the tax on individual stock set apart as a portion of the permanent fund for common schools.

The semi-annual examinations of the Branches required by the charter, have been duly made, and it does not appear that a single desperate debt has been contracted to any of the branches; but as many of the debtors are yet *untried*, experience alone can determine how far they can be relied on for punctual payments when it becomes necessary to exact them. The officers of the branches generally, are well qualified, and the duties confided to them, with scarce an exception, are well performed. At one of the examinations, it was attempted to ascertain what number of each employment of profession were then accommodated with loans, and it appeared that notes and bills had been discounted for 722 farmers, 339 merchants, druggists and grocers, 272 mechanics, 134 produce and cattle dealers, 87 manufacturers, millers and distillers, 121 persons of the different professions, 27 innkeepers, and 266 persons whose employment was unknown to the branch officers.

It was not to be expected but that differences of opinion, as to the construction of the charter, and the privileges granted by it, should arise. Such have occurred, not originating, it is believed, from wrong motives; yet, wherever these have led to questionable transactions they have been submitted to the State Board, whose proceedings have been in general, conducted with great unanimity. The operations of the several branches, present, on the whole, a state of prosperity without example in institutions and a community circumstanced like ours. Business was commenced under the most favorable auspices. The paper of the United States Bank, which had previously constituted our chief circulation, was rapidly disappearing, and but for our Bank, its place must have been supplied by the paper of local institutions, which could never have obtained general confidence. The State was free from pecuniary embarrassments, our citizens enterprising, our agricultural interests highly prosperous, and with a large surplus produce, it only required facilities to render these sources of wealth and prosperity available. Such facilities have been afforded by the Bank.

From the table annexed, it will appear that the loans

of all the branches on the 31st November, were				\$1,810,965 51
The paper in circulation	-	-	-	1,393,035 00
Specie in the vaults	-	-	-	797,811 97
Cash on hand, bank notes and specie	-	-	-	1,369,845 04



The circulation obtained by the paper, and the specie on hand, are such as have not often appeared in the operations of banking.

It will be important both for community and the bank, that at as early a period as possible, its customers should be of the right class. Before its organization, much of the produce of the State was purchased by foreign capital, and but a small portion of the profits of its exportation was realized by our own citizens, and when the Bank commenced operations, a year since, the season was too far advanced to afford our exporters as much aid as was desirable. The loans, therefore, not required for active business, have in some instances, been made for the purchase of lands from the Government or individuals. That temporary loans should be made for these purposes, cannot be objected to, especially when the funds for payment, are expected to be derived from other sources than the sale of the lands. But if funds are borrowed largely from the Bank to buy lands for speculation—if the farmers of the country forget that their prosperity depends upon raising good crops, and not upon an imaginary rise of the value of land—if town lots and quarter sections are to become *current* like promissory notes or bank bills, it must be apparent to every person of reflection, that though a few may realize immense fortunes before the bubbles shall burst, yet the effects must paralyze all that is good and desirable in community. The ordinary pursuits of business are neglected wherever a mania for speculation prevails. Many engage in enterprizes for which they were never calculated: the throng of competitors prevents all reflection, and a tempest succeeds, amidst which, industry, economy, order and good principles are lost. Every intelligent observer must be aware of the impossibility that general prosperity can be enjoyed except by gradually improving the condition of the different classes of community, in their respective occupations, yet, too often such persons lend their aid to convulse society to its foundations, with the hope of rising on the ruins.

Within the past year, the increase of population in the State has been much greater than in any preceding one. Emigrants from every part of the Union have been drawn hither by the new lands thrown into market, and the large field here opening for enterprize. Canals and rail roads are in progress and contemplation, that promise a vast addition to the wealth of many portions of the State. While these circumstances should lead us not to undervalue our advantages, nor lose sight of the high destiny the State may attain, it should be recollected, that we must depend mainly for prosperity upon our agricultural resources. Commerce and manufactures will hereafter improve, as they are needed, such positions as public convenience shall require, and these selections cannot be made, in most instances, until the direction given to the internal improvements of the State shall be more completely developed. In the mean time, however, the inclination to believe that what is most for their interest must take place, induces numbers to calculate largely upon the future growth of *embryo towns* that have nothing to recommend them but the wishes of their propri-

etors. The alternate growth and decay of western towns; the fluctuations to which they have been subject; and the wide spread ruin frequently occasioned by speculations in their property are well known, and though not a few may predict a different state of things hereafter, yet as seasons of depression and difficulty must come, it will be found that the residents of towns will, in general, feel their effects much more severely than any other portion of community.

It affords gratification to state, that the business of most of the branches has been so conducted as to have no direct influence in raising the prices of real property in their immediate vicinity: and it is believed that it has not been a leading motive at any of them to effect this object, and if for want of other customers, too many loans have been heretofore made to speculators in land and town lots, this evil will soon be corrected. Business paper, more than can be discounted, is now offered to several of the branches, and at all of them a rapid increase of business, profitable to them and useful to the country, may be perceived. If their operations be thus conducted, lands will advance in price, produce rise in value, and towns increase in size, on the basis of solid business, and the occasional depression of either will not be seriously felt, either by the Bank or community. That such depreciations may take place, and at no distant period, is not improbable. Produce for some years has borne high prices, from various causes. A large amount has been required for the accommodation of emigrants. The three last seasons have not been as productive as usual. The high prices of cotton, the great amount of capital introduced into some of the south-western states, and the rapid improvements made there within a few years, have occasioned an unusual demand for our products. The price of cotton is depreciating, that of other property will probably follow, and if such harvests should be here gathered, as have been heretofore, the prices may be, as they have been, one-third or one fourth of their present rates. The rents, and of course the prices of land must fall, to the injury, and perhaps the ruin of such as are in debt and calculating to pay by the produce of the soil or an increase of its value. These fluctuations in prices may be greater than ever heretofore, if a general system of internal improvements be commenced in the state, and nothing occur to check the extravagant calculations that under such circumstances may be indulged. The Bank may exercise an important influence in these matters by withholding its aid and encouragement from all schemes uncertain in their result, and that are adapted more for private advantage than public good, and this will be of the more importance from the vast field for business now opening around us into which many will rush without any experience of the difficulties to be encountered in the west. As the resources of the state are improved, and its capabilities ascertained, there will be opportunities in the establishment of manufactories and the greater diversity of pursuits, to insure more regularity in prices than has heretofore existed. When experience has shewn what will be the demand for an article, the over production and consequent re-action as to price, will, in a measure, cease.

In the formation of the charter for this institution, it could hardly be expected that no subsequent amendments should be necessary: Yet after the experience already had there is very little which it is desirable to change. The machinery works well, and its construction is creditable to the authors. There are, however, some restrictions, which, perhaps, might be removed without endangering the safety of the Bank, or the interests of the public; and further privileges it is believed, might be granted, by which it will be the better able to meet the new demands constantly making upon it by a rapidly improving community. In most parts of the state there are particular seasons of the year when the demand for capital is much greater, and its employment much more beneficial than at other times. More means for the purchase and exportation of produce are required at the river Branches during the autumn and winter than they can supply, and in the interior of the state it will not be long until loans cannot be supplied to the applicants, in the spring season, who wish to purchase cattle and hogs for the fall markets.

In framing the charter, this state of things was foreseen, and was intended to be provided for in the 98th section, which authorizes one Branch to loan to another, for a definite time, and issues to be made accordingly. But the time required to transfer the funds paid on New Orleans's bills to the eastern cities, and the advantages which arise from keeping funds to draw upon in New York and Philadelphia, will probably prevent all arrangements of the kind contemplated.

The banks should be allowed to contract and expand their operations to some extent, as the wants of business may require, must be a privilege of great value to the public. They can furnish money for short business transactions at a profit by expending their circulation, while individuals will not keep money on hand for temporary purposes. It is therefore respectfully suggested that the charter be so amended as to allow the branches under such restrictions as shall be proper, to extend at least occasional discounts to a larger amount than twice their capital.

An enlargement of the capital at some of the branches, appears to be required at this time, and will soon be needed at others.

The individual deposits in all the Branches for the last half year, have been as follows, at the close of each month, viz:

June	-	-	-	-	-	\$272,987 42
July	-	-	-	-	-	306,673 52
August	-	-	-	-	-	322,378 30
September	-	-	-	-	-	312,673 90
October	-	-	-	-	-	323,407 94
November	-	-	-	-	-	379,543 00

These amounts do not include the Government deposits, and are larger in proportion to the capital than those of any country banks in the U. States, or than most of the city banks. By the 109th section of the charter, the state reserves the power of investing its education and other funds in the Bank so as "to make them more productive;" and by the 21st section, the Bank may "receive deposits on such terms and



conditions as may be agreed upon:" Yet by the present charter, the funds of the state not subscribed as stock cannot be made productive, nor can the deposits, as they are now made, be profitable to the depositors, or an object of much consequence to the Bank. But if something like a savings fund institution could be engrafted on the branches —if they were encouraged to pay a small interest on deposits left for fixed periods; and if these could be used for the purchase of business paper, or other safe transactions, many of the wants and necessities which our increasing business requires, might be supplied by means that are now without use or benefit. All experience is in favor of the happy influence of savings banks. They promote economy and regularity; they encourage to action and industry, and as the tendency of money is to flow to places of business, may not an amendment to the charter be devised in this respect, that will add not less to the interest of the state than to the comfort and prosperity of individuals?

Annexed is a statement of the condition of the State Bank and each Branch respectively, on the 3d Saturday of November last, pursuant to the requisitions of the charter.

Respectfully submitted, on behalf of the Directors of the State Bank.

S. MERRILL.





R 21, 1835.

of oth- nches.	Notes of oth- er Banks.	Specie.
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# STATEMENT OF THE CONDITION OF THE BRANCHES OF THE STATE BANK OF INDIANA, On SATURDAY, NOVEMBER 21, 1835.

## RESOURCES.

Branch.	Bills discounted.	Bills of Exchange	Deposits in, & other Branches	Notes from and on Banks	Banking houses.	Other real estate.	Furniture.	Profit & Interest.	Canal Com'r's.	Com'r's S. Fund.	Drafts on Eastern Banks.	Remittance to N. York.	Notes of other Branches.	Notes of other Banks.	Specie.
Indianapolis	176,602 97	7,000	153,144 83	209,016 23			917 34		7,450		126,234 78	5,000	59,355	239,583	106,752 72
Lawrenceburgh	57,649 08	125,841 71	1,473 89	82,647 47		3,500	388							26,322	79,896 79
Richmond	198,969 89	2,000	5,145 32	184,754 49	2,877 52		168 87	1 10					32,500	90,700	109,111 68
Madison	144,905 15	114,172 02	616 80	33,951 73	4,396 07		223 74			18,50		13,750	250	77,607 50	82,892 25
New Albany	146,223 07	36,299 16	25,125	31,328 34			1,074 80	1 25					28,070	26,760	76,349 65
Evansville	153,874 27	12,053 94	8,357 61	53,755 45	1,000		867 39						2,555	16,800	50,289 93
Vincennes	149,615 76	1,785	7,084 16	22,663 88			528 07						10,280	52,015	70,692 16
Bedford	119,712 26	17,200	419 18	10,000	1,076 57		59 25				15,000		765	4,810	82,914 40
Terre-Haute	156,395 92	6,000	1,579 07	97,107 76	1,000		628 06	1 75					7,210	18,861 17	50,245 98
Lafayette	130,842 02	52,323 49	125	34,174 76	600		205 10	21 50	45,705		3,720			18,515	86,666 43
Total	\$1,434,790 19	376,175 32	203,072 86	759,600 09	10,950 16	3,500	5,060 92	25 60	53,155	18,50	144,954 78	18,750	140,985	572,033 67	797,811 97

## LIABILITIES.

Branch.	Capital stock paid in	Profit and loss.	Treasurer of U. States.	Pension Agent of Indiana.	Com'r of S. Fund.	Profit & Postage.	Deposits by other Branches	and due to & Banks.	Due of 1st div to Individuals.	Permanent School Fund.	Surplus Fund.	Notes in circulation.	Individual deposits.
Indianapolis	120,000	1,393 48	683,753 33	10,002 53	1,598		14,758 15	650	700	200	4,952 65	135,745	107,298 73
Lawrenceburgh	120,000	1,565 45		421 26	1,500	1 00	77,604 53	540 16	700	200	4,447 73	157,850	13,088 79
Richmond	120,000	1,112 12	287,400	1,453 49	20,484 36		10,562 18		700	200	4,164 15	171,050	22,852 37
Madison	140,000	2,547 93			1,500		54,208 22	6,820 96	700	200	6,450	195,255	52,355 25
New Albany	120,000	1,153 13	81,080 25	1,730 34	11,500 25		650	12,082 36	700	200	2,182 77	119,770	19,881 57
Evansville	120,000	804 24		517 43	1,500		12,968 75		700	200	2,057 93	126,885	33,980 24
Vincennes	120,000	570 29		1,215 21	1,500		9,778 75	226 05	700	200	1,718 46	161,480	17,275 15
Bedford	100,000	367 11		1,598 16	1,508 25	4 00	5,343 75		700	200	2,314 72	131,520	8,400 67
Terre-Haute	119,920 87	1,199 44			1,507		6,782 62	508 22	700	200	2,667 38	109,970	35,574 18
Lafayette	119,857 78	1,139 43		732 39	1,500		10,425 92	2,587 47	700	200	4,923 56	164,495	68,837 05
Total	\$1,199,778 65	11,852 72	1,062,238 58	17,670 81	44,097 86	5 00	203,082 38	23,415 22	7,000	2,000	36,179 35	1,534,020	379,543 00

## OFFICERS, AND THEIR COMPENSATION—AND RENT.

### STATE BANK.

Samuel Merrill, President,	-	\$1200
James M. Ray, Cashier,	-	1000
Rent,	-	100

### BRANCHES.

#### INDIANAPOLIS.

Hervey Bates, President,	-	\$700
Bethuel F. Morris, Cashier,	-	1000
Rent,	-	125

#### LAWRENCEBURGH.

Omer Tousey, President,	-	
Enoch D. John, Cashier,	-	\$1000
W. Thos. Chappell, Book keeper,	-	600
Rent,	-	125

#### RICHMOND.

Achilles Williams, President,	-	\$350
Elijah Coffin, Cashier,	-	1000
Noah Leeds, Clerk,	-	500

### MADISON.

James P. D. Lanier, President,	-	\$800
John Sering, Cashier,	-	1200
Rent,	-	125

### NEW ALBANY.

Mason C. Fitch, President,	-	\$300
Jas. R. Shields, Cashier,	-	1000
B. T. Thornton, Clerk,	-	400

### EVANSVILLE.

John Mitchell, President,	-	
John Douglass, Cashier,	-	\$1200
Rent,	-	150

### VINCENNES.

David S. Bonner, President,	-	
John Ross, Cashier,	-	\$1000
G. W. Rathbone, Clerk,	-	400
Rent,	-	150

### BEDFORD.

William. McLane, President,	-	\$200
Daniel R. Dunihue, Cashier,	-	600
John Brown, Clerk,	-	400
Rent,	-	65

### TERRE-HAUTE.

Demas Deming, President,	-	\$400
Aaron B. Fontaine, Cashier,	-	1000
William Mars, Porter,	-	182 50
Rent,	-	150

### LAFAYETTE.

T. T. Benbridge, President,	-	
William M. Jenners, Cashier,	-	\$900
Benjamin Henkle, Clerk,	-	400
Rent,	-	150

### FORT WAYNE.

Allen Hamilton, President,	-	
Hugh McCulloch, Cashier,	-	\$800
Rent,	-	140

JAMES M. RAY, CASHIER.

|| 18,750 00 || First dividend to individual  
 . 00 . 78 || stockholders . . .

7,000 00  
 2,000 00  
 5

4

# REPORT

ON THE

## STATE LIBRARY.

DECEMBER 10, 1835.

Read and laid on the Table

The Secretary of State respectfully submits to the General Assembly the following additions made to the State Library during the past year, viz:

Rail Road Journal, 4 vols.			\$10 00
The Koran			3 50
St. Pierre's Studies of Nature,	1	volume	1 50
Franklin's works,	2	"	4 75
Upham's Mental Philosophy,	2	"	4 75
Mosheim's Church History,	2	"	3 50
Jones' do	1	"	2 00
Stewart's Philosophy,	2	"	1 25
Brown's do	2	"	2 25
Capt. Ross' second Voyage,	1	"	2 00
Memoir of the life of Wm. Livingston	1	"	2 25
Gutzlaff's History of China,	2	"	2 00
Adventures on the Columbia river,	1	"	1 50
Kay's Travels	1	"	1 00
Edgeworth on practical Education,	1	"	1 25
Reports on locomotive and fixed Engines	1	"	2 00
Webster's Speeches,	2	"	2 25
Universal Gazetteer,	1	"	3 50
Memoirs of Marshal Ney,	1	"	1 50
Sturm's Reflections,	1	"	2 00
Wood's Mosaic History,	1	"	2 00
History of the Rev. in England in 1688,	1	"	3 25
Cavallo's Philosophy,	1	"	2 25
Dumont's Reflections of Mirabeau,	1	"	1 50
Jefferson's works,	1	"	1 00
Letters from Constantinople,	2	"	1 75
do do Russia,	1	"	75
Moore's History of Ireland	2	"	75
Specimens of Table Talk,	1	"	80
Political Grammar,	1	"	75
Transactions of College of Teachers,	1	"	1 00

Hopkin's Political Economy,	1	volume	62
France,	2	"	1 25
Moore's works,	1	"	2 00
Joanna Baillie's Poetical works,	1	"	3 00
Pope's works, <sup>1</sup>	1	"	2 00
Sterne's works,	1	"	1 50
Hannah Moore's works,	2	"	2 50
Cowper and Thompson,	1	"	2 00
Scott's works,	1	"	1 75
Smollett's works,	2	"	4 00
Fielding's works,	2	"	4 00
Tatler and Guardian,	1	"	2 00
British Drama,	2	"	3 25
Visit to Texas,	1	"	1 25
Gil Blas,	3	"	4 00
Decameron by Boccaccio,	2	"	2 00
Pindar's works,	1	"	1 50
Burns, do	1	"	1 25
Pamela,	1	"	1 25
Secrets of female Convents,	1	"	87
The Sketch Book,	2	"	1 33
Moore's Sheridan,	2	"	1 50
Edgeworth's works,	10	"	10 00
Dick's do	4	"	4 00
Classical Library,	7	"	3 50
Family do	2	"	1 00
American Almanac for 1835,	1	"	75
Lives of Scottish Poets,	3	"	1 50
Seneca's Morals,	1	"	75
Jefferson's Manual,	4	"	2 25
Byron's works,	1	"	3 50
Life of Talleyrand,	1	"	1 50
Hemans, Heber & Pollock,	1	"	2 25
Memoirs of Hannah Moore,	1	"	2 00
Sismonoi's Roman Empire,	1	"	2 00
Canning's Speeches,	1	"	2 33
Reynold's Voyage,	1	"	3 50
Conquest of Florida,	1	"	1 75
Wood on Rail Roads,	1	"	2 25
Expense of purchasing and transportation			23 00
			<hr/>
			\$183 46

There is yet in the hands of the Librarian, an unexpended balance of the last year's appropriation, of \$16 55.



There have been received during the present year from the state of North Carolina 3 copies of the Acts of 1834.

Georgia	3	"	"
New Jersey	2	Compilation of public Acts.	
"	3	Acts	1834.
Vermont	2	"	"
Rhode Island	3	"	1833 & 1834.
Alabama	3		1834.
"	3		1835.
Kentucky	2		1834.
"	2	Digest of the Statutes.	
Delaware	3	Acts of	1835.
Massachusetts	3	"	"
New York	3	"	"
New Hampshire	3	"	"
Maryland	3	"	"
Virginia	1	"	"
Ohio	3	"	"
Pennsylvania	3	"	"

From the Department of State of the United States 260 copies Acts of Congress of 1835, and 3 sets of Congressional documents 1st session of the 23d Congress, containing 25 vols. each.

The Joint Resolutions of the last session of the General Assembly, directing the transmission of the Reports of the Supreme Court to the respective states, has been complied with, and there have been received, in exchange, from the state of

Kentucky, Dana's Reports,	2 vols.
" Pirtle's Digest,	2 "
Maryland, Gill & Johnson's Reports, the 5th	"
New Hampshire, Reports,	6 "
Missouri, "	3 "

Letters have been received from the Executive Departments of New York and Pennsylvania which justify the belief that the numerous and valuable Reports of those states will soon be forwarded.

Respectfully submitted,

WM. SHEETS.

THE UNIVERSITY OF CHICAGO PRESS

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DECEMBER 12, 1835.

Read and referred to the Committee on the Canal Fund.

INDIANAPOLIS, December 12, 1835.

*To the General Assembly of the State of Indiana:*

The Canal Fund Commissioners in compliance with the act entitled "An act establishing a State Bank," approved 23th January, 1834, report,

That on the 3d day of August last, bonds of the State of Indiana, for the second instalment of the loan authorized by said act, amounting to the sum of four hundred thousand dollars, were sold by the undersigned at the city of New York to J. J Cohens jr. & Brothers, of Baltimore.

The bonds bearing an interest of 5 per cent. per annum payable semi-annually on the first days of January and July at the Merchants' Bank of the city of New York, and redeemable according to the provisions of said act, were sold at a premium of 4½ per cent. Copies of the bonds are filed in the office of the Secretary of State, as required by law.

They further report, that by a subsequent negotiation, for the purpose of putting in operation the Branch at Fort Wayne, bonds of the state for the further sum of fifty thousand dollars, bearing an interest of 5 per cent. per annum, and payable as above, were sold to Prime, Ward & King, of New York, at the like premium of 4½ per cent. Copies of those bonds are also filed in the office of the Secretary of State.

The money obtained by the sale of the foregoing bonds was deposited in the Merchants' Bank of the city of New York, at an interest of 4 per cent. per annum, subject to the order of the President of the State Bank.

All of which is respectfully submitted,  
NICHOLAS McCARTY.  
JER. SULLIVAN,  
SAM'L. HANNA..

# 新西遊記

第一回

唐太宗皇帝三藏取经记

第一回

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6

# SENATE.

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## REPORT

OF

TREASURER OF STATE,

IN RELATION TO

## THE THREE PER CENT. FUND.

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DECEMBER 15, 1836.

Read, referred to the Committee on Roads, and 300 copies ordered to be printed.

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TREASURER'S OFFICE, }  
Indianapolis, 12th Dec. 1835. }

HON. DAVID WALLACE,  
*President of the Senate:*

I herewith transmit to be laid before the Senate, a statement of the operations and condition of the 3 per cent. fund.

N. B. PALMER, *Treasurer*  
*and Agt. 3 per cent. fund.*

The total amount received from the U. States prior to the 1st Dec. 1834, including also \$2,550 00 received from the State Treasury is - - - - - \$200,066 30

There has been received from the U. States the present year - - - - - 24,398 52  
 ----- \$224,464 82

The payments from this fund, on the various appropriations to roads, rivers and counties, prior to the last annual report, amounted to - - - - - 176,427 08

There had been paid the present year on same account - - - - - 29,078 72

The total amount of incidental expenses, including Agent's Salary &c., up to the present time, is - - - - - 4,500 94  
 ----- \$210,006 74

14,458 C8

Leaving a balance on hand on the 1st day of December, 1835, of \$14,458 08.

The following table will show the amount appropriated to each of the several objects to which the fund has been directed. Also the amount paid to, and the balance due to each.

So fast as the appropriations to roads and rivers have been fully paid off, the amounts appropriated and the amounts paid, have been consolidated under their proper heads; there being no apparent necessity of reporting them in detail, after being liquidated.

In order to satisfy the enquiries which are constantly making, I have added to the table a column showing the amount paid to each county &c., the present year.

No. of Road and County.	Road Commissioners and Names of Counties	Appropriations to each Road and County.	Amount paid on each.	Balance due to each.	Am't paid since last report.
Road No. 12	Geo. White	\$ 2,712 23	\$ 2,701 19	11 04	
14	Gara Davis	3,033 80	3,025 02	8 78	
	Am't appropriated } & paid on 53 roads }	111,740 05	111,740 05		\$255 61
	Am't appropriated } & paid on 10 rivers }	2,050 00	2,050 00		100 00
1	Allen (County)	1,387 50	800 00	587 50	
2	Adams	1,500 00	900 00	600 00	490 00
3	Boone	1,500 00	1,410 33	89 67	510 33
4	Bartholomew	1,500 00	900 00	600 00	88 57

5	Clinton	1,387 50	1,197 83	189 67	397 83
6	Carroll	900 00	700 00	200 00	
7	Cass	1,000 00	910 00	90 00	10 00
8	Clark	1,500 00	900 00	600 00	
9	Crawford	1,500 00	1,019 00	481 00	119 00
10	Clay	1,387 50	1,297 83	89 67	397 83
11	Dearborn	1,500 00	900 00	600 00	
12	Decatur	1,500 00	1,180 00	320 00	280 00
13	Dubois	1,500 00	1,410 33	89 67	610 33
14	Delaware	1,500 00	1,410 33	89 67	610 33
15	Davies	1,500 00	900 00	600 00	
16	Elkhart	1,500 00	1,410 33	89 67	610 33
17	Fountain	900 00	900 00		
18	Floyd	1,500 00	900 00	600 00	100 00
19	Franklin	1,500 00	880 00	620 00	40 00
20	Fayette	1,500 00	1,410 33	89 67	610 33
21	Gibson	1,500 00	900 00	600 00	100 00
22	Grant	1,500 00	1,019 00	481 00	219 00
23	Greene	1,500 00	900 00	600 00	
24	Huntington	1,387 50	1,297 83	98 67	897 83
25	Harrison	1,500 00	1,410 33	89 67	510 33
26	Hendricks	1,500 00	1,410 33	89 67	510 33
27	Hancock	1,500 00	1,410 33	89 67	510 33
28	Hamilton	1,500 00	1,410 33	89 67	510 33
29	Henry	1,500 00	900 00	600 00	100 00
30	Jackson	1,500 00	1,310 33	189 67	510 33
31	Jennings	1,500 00	1,410 33	89 67	510 33
32	Jefferson	1,500 00	1,089 00	411 00	89 00
33	Johnson	1,500 00	1,291 33	208 67	391 33
34	Kosciusko	600 00	320 00	280 00	320 00
35	Knox	900 00	800 00	100 00	
36	Lawrence	1,500 00	1,019 00	481 00	219 00
37	Laporte	1,500 00	1,400 00	100 00	600 00
38	Lagrange	1,500 00	1,410 33	89 67	510 33
39	Miami	1,300 00	900 00	400 00	300 00
40	Montgomery	1,387 50	1,297 83	89 67	487 83
41	Morgan	1,500 00	1,310 33	189 67	410 33
42	Marion	1,500 00	1,085 00	415 00	155 00
43	Madison	1,500 00	1,410 33	89 67	510 33
44	Martin	1,500 00	1,410 33	89 67	610 33
45	Monroe	1,500 00	1,410 33	89 67	510 33
46	Orange	1,500 00	900 00	600 00	500 00
47	Owen	1,500 00	1,410 33	89 67	510 33
48	Parke	900 00	960 00		
49	Posey	1,500 00	900 00	600 00	200 00
50	Pike	1,500 00	1,410 33	89 67	610 33
51	Perry	1,500 00	900 00	600 00	500 00
52	Putnam	1,387 50	1,297 83	89 67	397 83
53	Ripley	1,500 00	1,385 33	114 67	510 33

54	Randolph	1,500 00	900 00	600 00	
55	Rush	1,500 00	1,410 33	89 67	510 33
56	St. Joseph	1,500 00	1,410 33	89 67	510 33
57	Scott	1,500 00	1,410 33	89 67	610 33
58	Switzerland	1,500 00	850 00	650 00	
59	Spencer	1,500 00	1,015 14	484 86	215 14
60	Shelby	1,500 00	900 00	600 00	
61	Sullivan	900 00	900 00		100 00
62	Tippecanoe	900 00	900 00		100 00
63	Union	1,500 00	900 00	600 00	
64	Vermillion	900 00	900 00		100 00
65	Vanderburgh	1,500 00	1,410 33	89 67	610 33
66	Vigo	900 00	800 00	100 00	
67	Wabash	1,387 50	700 00	687 50	60 00
68	Warren	900 00	900 00		100 00
69	Washington	1,500 00	900 00	600 00	
70	Warrick	1,500 00	1,400 00	100 00	600 00
71	Wayne	1,500 00	1,410 33	89 67	610 33
72	White	487 50		487 50	
	Wabash appropriation	7,000 00	7,000 00		7,000 00
		<u>225,736 08</u>	<u>205,505 80</u>	<u>20,230 28</u>	<u>29,078 72</u>

By this table, it will be perceived that there has been specially appropriated to roads, rivers, and counties, the sum of \$225,736 08

The total amount received by the Agent from the U. States and from the State Treasury, is - - - - - 224,464 82

From which deduct the total amount of incidental expenses - - - - - 4,500 94

219,963 88

\$ 5,772 20

Exhibiting a balance of appropriation, over the amount paid to the Agent, of \$5,772 20

This balance, when received and appropriated amongst the different counties, will make a dividend of about \$90 to each county and which may be expected to be in readiness by the middle of next summer.

All of which is respectfully submitted.

N. B. PALMER, *Treas. of State,*  
and *Agt. af 3 per cent. fund.*



7  
H. R.

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## REPORT

OF THE

## TRUSTEES OF HANOVER COLLEGE.

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DECEMBER 16, 1835.

Read, referred to the committee on Education, and 1200 copies ordered to be printed.

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*To the honorable the members of the Senate and House of Representatives  
of the state of Indiana.*

In compliance with the requisition expressed in the charter of Hanover College, the Trustees of said College beg leave respectfully to submit the following REPORT.

In presenting our third annual report of the condition and prospects of the institution, we cannot forbear calling the attention of your honorable body to the evidence that it continues to enjoy the confidence of the community in the midst of which it is located. Reference to the annual catalogues shows that the number of students is gradually and constantly increasing. Especially will it be observed that the number of those who pursue a regular course of academic study is yearly augmenting: a fact no less interesting to the patriotic citizen of the west than to the immediate friends of the institution. It will not, moreover, escape notice that *six students* have been dismissed as giving no promise of increased usefulness commensurate with the time and money expended in the prosecution of a liberal course of education. This shows that increase of number is not to be referred to as a low standard of intellectual attainment. On the contrary we would not shrink from a comparison between our course of study and that of any college East or West. And our published course is a faithful record of the business of the recitation room. While these facts are not presented in a spirit of boasting, it cannot but be gratifying to be able to present



and evidence also, we trust, that it continues to merit that confidence.

Of the Manual Labour System we have little save our unabated attachment to it, to report. As with all great original ideas, reasoned upon in the abstract, the practical details of the system do not, in all respects, conform to the prototype of theoretical calculation. There is no science whose pure abstract principles can be reduced to practice, without meeting, in a greater or less degree, limiting principles. It will not be thought surprising, therefore, that our Manual Labour Department has, in many respects, been modified since its first establishment. But we do not, with some, give up the plan, because experience requires us to abandon some of the more crude results of theoretical reasoning. Since in this very thing we find analogies to other useful inventions. The great scheme of uniting with study some useful and healthful exercise of the body, we regard as one of the most valuable discoveries of the present inventive age, and this opinion is taking faster hold of our belief from the results of our own experience.

The simple fact that our large number of students are exempt from all disease, save an occasional attack of transient illness such as is incident to men in ordinary life, we think, will scarcely find a parallel in the history of colleges. Since the commencement of the institution, nine years ago, in the form of a grammar school, but two deaths have occurred among those connected with it. As a means, therefore, of physical discipline,—of hale and natural activity of the several organs of the body, so indispensable to an unconstrained action of mind, we regard the "Manual Labour System" as chiefly valuable. This opinion we deem it needless to discuss. Still we would by no means leave out of view the subordinate purposes to which it is subservient. It surely will not be viewed as of small importance, as a means of pecuniary revenue, when it is known, that a large number of indigent youth do, in this way, defray a great part of their expenses; and that without such means of support they would be shut out from the privileges of college. Thus, the halls of college are no longer accessible alone to those who apply the "*golden key*." We would also call your attention to the effect of the system on the character of the student who engages in it. It fosters a spirit of self dependence and begets an enterprising activity, which will be of incalculable advantage in the public walks of life. While, therefore, we have no important change in the general features of the system, to report, we beg leave to state that the plan presented in our last report has been enlarged and improved, by the addition of an extensive Book Bindery and an additional Cooper Shop. We have only to regret that our want of funds prevents our extending the system to that degree of perfection and utility of which our experience shews us it is susceptible.

In conclusion, permit us to repeat, what we have had the happiness hitherto to state, that in the more immediate direction and management of the affairs of College, the Faculty are singularly united in their views and feelings; and that docile subordination and diligent attention to study are the most striking characteristics of the students. We may

such evidence of the confidence which is reposed in Hanover College, further add, that while the great and leading principles of christianity are daily inculcated upon the minds of the students, no appeal is ever made to sectarian predilections, nor are the rules of morality measured by the tenets of any particular religious creed. We are happy to say that students of various religious denominations are peaceably pursuing their studies in Hanover College. We confidently hope that, with the blessing of Divine Providence, our institution will become an honour to our state and a blessing to our country.

JOHN MATTHEWS, Ch'n.

T. H. BROWN, Sec. Ex. Com. B. T. H. C.



8  
**H. R.**

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**REPORT**

OF THE

**ENGINEER ON THE MICHIGAN & WABASH CANAL.**

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DECEMBER 15, 1835.

Laid on the table, and 1,200 copies ordered to be printed.

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INDIANAPOLIS, Dec. 14th, 1835.

Hon. C. B. Smith,

*Speaker of the House of Representatives:*

SIR—

At the suggestion of his Excellency the Governor, I have the honor to transmit to you, with a request that they may be laid before the Legislature, a Report upon the projected Michigan and Wabash Canal, with the accompanying estimate, field notes, and illustrative drawings in Plan and Profile.

The survey to ascertain the practicability of uniting by a canal, the waters of Lake Michigan with those of the Wabash river, through the valleys of the St. Joseph of the Lake, Kankakee, Yellow river, and Tippecanoe; as also through the valleys of the Big and Little St. Joseph, connecting with the Erie and Wabash Canal at Fort Wayne; was made by me in the summer of 1829-30, by direction of the Engineer Department of the U. S. The duplicate copy of the Report and illustrations, made at Washington and intended to be conveyed to the state in 1832, by some accident missed their destination and have been mislaid, under circumstances a little unfavorable, until they were fortunately discovered a few days since.

It is matter of congratulation that these valuable records have been recovered in a good state of preservation; at a time too when the subject of internal improvements will occupy an unusual share of attention in the councils of the State.

With sentiments of respect,

I have the honor to be,

Sir,

Your obed't serv't,

**HOWARD STANSBURY,**

*U. S. Ass't Civ. Engineer.*



Lieut. Colonel JOHN J. ABERT,

*Topographical Engineer, U. S. A.*

SIR—

I have the honor to transmit to the Department a report of the operations of the party engaged under my directions, during the seasons of 1829 and 1830, in carrying into effect instructions from this Department, dated April 23d, 1829, and June the 9th, 1830, directing examinations to be made in the State of Indiana, having for its object, "to ascertain the practicability of uniting by a canal the waters of Lake Michigan with the Wabash river."

By the instructions issued by the Board of Internal Improvements, two routes were ordered to be examined and compared, which are therein described as follows, viz:

1. "The first would ascend the valley of the St. Joseph river (of the Lake) to leave it a convenient point near to Kankakee river; then it would cross to this stream, to descend its valley down to the mouth of Yellow river, thence up the same to a point from which a cross canal could be run to Tippecanoe river. From thence the route descends this stream, and then the Wabash to the head of steam boat navigation.

2. "The other would ascend the valley of the St. Joseph river (of the Lake) up to one of its head branches, from thence to the fork formed by the St. Joseph and St. Mary's river, then from that point through the valley of Little river to the Wabash as far down as the head of steamboat navigation."

Both of these routes have been surveyed, and accompanying this report are the Plans, Profiles and field notes, in duplicate, an estimate of the comparative expense of the two routes, together with a general map upon a reduced scale, embracing the country through which lines have been run with a view to the connection of the Wabash river with Lake Erie, as well as the particular connection which is the subject of this communication.

Before entering upon the examination of either of these routes with instruments, reconnoissances were made, and every opportunity of obtaining information as to the quantity of available water upon either summit as well as respecting the general features and characteristics of the country, was eagerly embraced. But although the contemplated connection was destined to be made between points comparatively well known, the intermediate country (upon the southern route especially, which is for the most part included within the Indian boundary lines) had never been explored. All accounts of it were in consequence so general, vague, and unsatisfactory that little or no reliance could be placed upon them. With the exception of a comparatively small portion, some of the lands belonging to the government had never been surveyed, and hence no maps having any pretensions to accuracy were in existence. I have, however, to acknowledge my obligations to many gentlemen of that state for the kind interest they took in the successful prosecution of the examinations; the information they com-



municated was of much use in guiding the operations of the party, and preventing a waste of time and labor in fruitless investigations; and the ready kindness which they displayed on all occasions when opportunity was afforded for its exercise, demands my grateful remembrance.

With these difficulties before us, with little if any other guide than the spirit-level, and such data as were gradually developed by the progress of the surveys, and indeed, from the nature of the examinations itself, it was not to be expected nor is it pretended, that the lines have, in every instance, been carried over ground the most suitable. No doubt is entertained that when the lands shall have been surveyed and settled, and thus the particular features of the country, the bearing of the streams better known, and such other knowledge gained by this means as is highly useful to the engineer, the distance upon both routes may be somewhat lessened. The operations which have been executed were intended chiefly to ascertain the practicability of either or both modes of connecting these waters, and to collect data upon which to base an estimate of their relative superiority. The selection of the precise ground over which the canal should pass, with the location of the sites of the locks, dams, and other structures appertaining to a canal, belong more properly to the actual construction of the work and must be the result of more particular and minute examination than could be given upon a preliminary survey. Endeavors however have been made to approximate as nearly to such a location as possible, when it could be effected without too great a sacrifice of time.

No directions as to the dimensions of the canal having accompanied the instructions of the Board it has not been thought proper to vary from the dimensions of the transverse section adopted in the estimate for a similar work, to connect Lake Erie with the Wabash river, which are as follows, viz: 40 feet wide at the the surface, 28 feet at bottom, 4 feet deep with a tow-path of 10 feet and guard bank 5 feet wide at the top, the tow-path and the guard bank to be two feet above the surface of the water in the canal, with an in and out-slope of 1½ to 1. No modification of this size has been taken into view in the estimate, although it is believed that in many instances it may be proper to contract the width of the canal; yet the nature and extent of these departures from the general plan must depend altogether upon the location of the line and circumstances arising from it.

The great scarcity of stone along the greater part of both routes, precludes all idea of making use of this material generally in the construction of locks. So far as our researches for it have extended, little or no success has attended them. All locks, dams, aqueducts, and culverts therefore are estimated to be constructed of wood. Suitable timber and of excellent quality is to be found in abundance wherever it shall be needed. It may be a subject of after consideration whether it would not be good policy to construct the locks along side the spot where they should ultimately be placed, in order that when they begin to decay, stone locks, the material for which can then be transport-

ed at a comparatively trifling expense may be constructed upon their proper sites, without interrupting the navigation of the canal. It is deemed proper that the locks should not be less than 90 feet between the hollow quoins and 12 feet wide in the clear. The expense of these wooden structures it is believed, will not exceed one-third that of similar works of stone, and they will last with little repairs for eight or ten years.

It is believed that in many instances, short wooden trunks may be advantageously used to pass the canal over small streams, in preference to allowing heavy embankments to rest on wooden arches, which, besides their greater liability from their situation to decay cannot be repaired, as the former may without serious interruption to the navigation.

It may here be remarked that in the preparation of the estimates, regard has been paid to the prices given for work of a similar nature upon the Ohio canals. In the prices of excavation and embankment, the cost of grubbing is included.

As has been before stated, two distinct and separate routes were directed to be examined and compared, one by means of the St. Joseph river (of the Lake,) the Kankakee and Tippecanoe rivers, the other by means of the tributaries of the St. Joseph (of the Lake) and of the St. Joseph of the Maumee. The former will be designated in this report, as the Kankakee and St. Joseph, or more summarily "*the Southern route,*" the latter as the Big and Little St. Joseph, or "*Northern route.*"

The whole of the first of these routes, and the great part of the summit section of the other, were examined during the season of 1829; that of 1830 was occupied in finishing the examinations upon the Northern route, and in preparing plans and estimates as to the expense and relative merits of the two lines of communication.

## SOUTHERN ROUTE.

The St. Joseph river (of the Lake) takes its rise in the territory of Michigan, and after pursuing a south-westerly course for about fifty miles, enters the state of Indiana, when suddenly turning to the north, it re enters the Territory and runs in a north-west direction until it discharges its waters into the Lake. The point at which it thus turns to the north is termed the "Great" or "Southern Bend;" just below this bend is a small stream which discharges itself into the river from a little lake or pond about two miles distant. This lake or pond is also the fountain head of the Kankakee or Theakikee river, a very considerable branch of the Illinois. There is a portage at the bend of about six miles from the St. Joseph to the Kankakee. Several experimental lines were run over this summit, and a base mark established, whence a line of levels were carried down the St. Joseph (of the lake) by one division of the party, whilst the other pursued the examinations of the valley of the Kankakee; and the result has fully demonstrated the complete practicability of this connection.

This route is divided into three sections, viz:

*Northern Section.*—From the debouch of the canal into the St. Joseph (of the Lake) near its mouth, to base mark on the summit.

*Middle Section.*—From base mark on the summit to the Tippecanoe river.

*Southern Section.*—From the intersection of the line with the Tippecanoe, to its termination at the mouth of that river.

Before entering upon any further description of this part of the surveys, it must here be observed, that both the northern and that part of the middle section lying between base mark and Yellow River, will have to depend for a supply of water upon the St. Joseph alone. Fortunately that stream is fully able to meet the demand. It yielded on the 25th of July, 1829, 1395 cubic feet per second, and as the water was at that time very low, its discharge may be considered as nearly its minimum. It has been stated to us as a fact well established, that whilst the waters discharging themselves into Lake Erie and the Ohio, or those running south and east, are much affected by the drought, inasmuch as to become nearly dry during the summer, those running westwardly into Lake Michigan, are remarkable for their uniform and constant discharge, being seldom if ever affected by the dry season, nor rising more than three or four feet at seasons when the others rise to great heights, overflowing the whole country through which they run.

There will have to be a feeder  $7\frac{1}{2}$  miles in length, together with a dam across the St. Joseph 26 feet in height to supply the summit. This dam will have to be built of the best materials, and in the very best manner, to resist the great pressure of the current, and will add very considerably to the expense of this route. Should any doubt however be felt as to the ability of a work of that height to withstand such a pressure, the danger can be lessened by erecting the dam higher up the river, and thus diminishing the height; but the feeder must in that case be proportionably lengthened. It is believed that by taking the water out at the lower level, the price of the work would be very materially enhanced, as the whole line from base mark to Yellow river, a distance of 38 miles (and which will have to depend upon this stream for a supply) is carried down without a lock; every foot therefore that the dam is lowered, will add that depth to the excavation for the whole of that distance. Assuming one and a half cubic feet of water per second per mile as sufficient for the supply of a canal of this size, there will remain at the disposal of the canal for hydraulic purposes, more than twelve hundred feet per second, which, with the great increase of power gained by a fall of 26 feet, cannot fail to produce a considerable revenue, and thus lessen the ultimate cost of the dam.

The total cost of the dam and feeder according to the estimate herewith submitted, amounts to \$121,367 14.

## NORTHERN SECTION,

*From Base Mark to debouch of the Canal into the St. Joseph (of the Lake.)*

This section comprises that part of the canal which follows the valley of the St. Joseph, and is divided into three sub-divisions:

*Sub-division 1st,* (map sheets 1 and 2) commences at base mark and



terminates at a small Indian village a short distance below the town of Niles—distance 11 miles—descent 16 feet—2 locks.

The soil upon this sub-division is a mixture of sand, clay, and gravel, and easy of excavation. Owing to its high level above the St. Joseph. some heavy embankments will be necessary to pass the canal over deep ravines and depressions. Some walling also will be required, and an aqueduct over the "river of the Fathers" which however will be short.

The expense of this sub-division as estimated is \$83,024 14

*Sub-division 2d*—from the end of sub division 1st, to B. M. 20—distance 18 miles 1,621 yds—descent 32 feet—4 locks.

From base mark 29 miles, 1,621 yards, 48 feet—6 locks.

(Map sheet No. 2.)

This sub-division passes over ground, a considerable portion of which is side cutting, in many cases requiring protection walls to guard the embankments from injury from the shocks of ice and timber that descend in the spring. The winding course of the river on this sub-division, increases the length of the canal very much: the distance on a direct line does not exceed six and a half miles, while the distance by the route pursued is rather more than fifteen. Some doubts have been entertained whether it would not be proper to cross the river near bench mark 10, (map sheet No. 2) and, either recross it near bench mark 18, or continue the canal on the the eastern side of the river to its termination. In either case it is believed the expense of construction would be materially diminished.

These circumstances have raised the cost of this sub-division considerably above that of the preceding one.

The estimate of this sub-division amounts to \$224,191 61.

*Sub-division 3d*—from bench mark 20, to the debouch of the canal into the river.

Distance 12 miles 1,034 yards, descent 79.87—10 Locks.

From base mark 42 miles 895 yards, descent 127.87—16 Locks.

In order to avoid as much as possible, heavy embankments and walling in the river, and exposing the canal to freshets, the line on the preceding sub-divisions was kept up, thus enabling us to keep back from the bold shores and steep banks of the river.

On this sub-division, however, the ground changes its character. Extensive bottoms are generally found between the bluffs and the river, allowing a choice of ground; the line was accordingly carried down by proper reaches into the flats below, to its debouch into the river. Some steep side cutting occurs, which however can be avoided by lessening the distance between the locks, and thus sooner attaining the level of the bottoms, as there is no object to be gained by preserving the high level formerly kept up.

The canal enters the river about three miles from its mouth: the water up to this point is never less than five feet in the most shallow parts, and averages from 10 to 12, affording a large natural basin safe from the storms of the Lake. Vessels of 300 tons burthen have come up as high as the point of termination of the canal. A tow path of about three miles in length will be required to carry the canal entirely

to the lake, should it be deemed necessary, but the cost of which has not been included in this estimate.

The Department is already aware of the obstructions that exist at the mouth of the river, to its free entrance at all times, but as it is understood that examinations have been ordered with a view to their removal, any remark upon the subject will be unnecessary.

The whole estimate for this sub-division amounts to \$173,659 42.

#### SUMMARY OF THE NORTHERN SECTION.

Sub-division.	Distances.		Descent.	No. of Locks	Estimate.
	<i>M.</i>	<i>Yds.</i>	<i>Feet.</i>		
First	11		16	2	\$83,024 14
Second	18	1,621	32	4	224,191 62
Third	12	1,034	79.87	10	173,659 42
	42	895	127.87	16	480,875 18

#### MIDDLE SECTION.

*From Base Mark on the Summit to Tippecanoe.*

This section is divided into two sub-divisions, the first extending from base mark to Yellow river, and the second embracing the dividing ground between that river and the Tippecanoe.

*Sub division 1st—Length 37 miles, 1,110 yards—(Map. sheets, 1 and 3.)*

This sub-division as has been before stated, will have to depend for its supply of water upon the St. Joseph alone. After crossing the summit between the Southern Bend of the St. Joseph and the Kankakee, the line strikes the valley of the latter, and leaving it about half a mile to the right, gradually diverges from it until it crosses Yellow river, rather more than ten miles above its junction. It is carried for the most part along the foot of the bluff skirting the wide prairie through which that stream runs, and from which it derives its name of the "Kankakee Prairie." This prairie lying at an elevation of not more than two or three feet above the level of the river, is very wet and swampy, even in the dryest seasons, and abounds in springs. The Kankakee runs through it without forming any bank for itself, occupying merely a bed sufficient for its waters in the dry season, and in the spring and fall, overflowing the whole country far and wide, and forming what is called "the Kankakee Pond." The bluff above mentioned forms the eastern boundary of the valley, and is low and much broken.

The cutting for the first nine miles will be much greater than on any other part of this sub-division, averaging 8.6 feet the whole distance. The soil consists of wet and dry prairie, and the excavation is of the easiest kind. At the end of 12 miles, the line ceases to run in the prairie exclusively and begins to attain a slight elevation above it, being carried either on the side or the top of the small bluff that skirts



it; continuing however to cross small spurs of wet prairie, which puts into the bluff so far, that it could not be carried around them without materially increasing its length.

The soil of these wet prairies after penetrating the turf with which they are covered, is found to consist of quick-sand and soft mud, in most instances of great fluidity and considerable depth. Embankments will be required to pass the canal over them, the earth for which, consisting of a mixture of sand, clay, and pretty coarse gravel, is generally convenient.

Owing to the impracticability of approaching the Kankakee from the swampy nature of the prairie, no accurate estimate could be formed of its fall, but judging from that of Yellow river in the neighborhood of where the line crosses that stream, it must be considerable. But of this fall, whatever it be, the line of canal does not partake, because instead of pursuing the course of the Kankakee, which runs in a south-westerly direction, it follows the foot of the bluff which diverging from it, turns to the south, and skirting the head of the valley, only extends across, without dropping the level at which it diverged, till it reaches the stream of Yellow river. Owing to this circumstance the canal for the whole length of this sub-division can be constructed on a single level. From the great length of this level, it is proper that a fall of from one to two inches per mile should be given to the bottom of the canal; to prevent stagnation, and to facilitate the passage of the water that is introduced into it from one end only. This would throw the surface of Yellow river somewhat above the level of the canal, but as all the available water of this stream will have to be taken for the support of the canal over the summit between itself and the Tippecanoe, all that is not appropriated to this object can be passed either through the canal or under it by a large culvert. From our previous ignorance of these circumstances, which were thus developed during the progress of the examinations, no allowance for this fall has been made, but an estimate for crossing Yellow river by an aqueduct, accompanies this report.

The whole estimated cost of this sub-division is \$357,002 06

*Sub-division 2d*—from Yellow river to Tippecanoe:

Length 9 miles 1,140 yards.

From base mark 47 miles, 490 yards. (Map sheet No. 4.)

This sub-division comprises the summit between these streams. Several experimental and random lines were run over this ground, with a view of ascertaining the shortest and least expensive route. Some vague information had been given us of a large lake upon this summit, called by the Indians, (within whose boundary lines the whole of this and the succeeding, as well as the greater part of the preceding sub-division are included) Mex-sin-kuk-keek, and which it was stated would be amply sufficient for the supply of all water that might be needed. Examinations were accordingly made to ascertain the position of this lake, and the practicability and fitness of a connection by means of it, and lines were run from Yellow river to it, and thence to the Tippecanoe. It was found that, although the connection was practicable, yet

the lake lay nearly ten miles to the left of the direct course of the desired communication, and the cutting that would be required between it and Yellow river, a distance of five and a half miles, would be very great, averaging 18 feet, and in some instances rising as high as 44 feet. This route was therefore abandoned, and another more direct was sought for. By following the general course of the line, it was found that another lake lay immediately in our way, which although not so large as the former, was nevertheless fully capable together with Yellow river and the surplus water supplied by Sub-division 1st, to feed the canal over this summit. The ground over which the canal will have to pass, by this route, is not so high as on the other; in consequence of which a thorough cut can be made through it, thus forming a single level from the Kankakee summit to the Tippecanoe; whereas by the Mex-sin-kuk-keek route, in addition to the deep cutting, four locks of 8 feet each will be required.

This route is termed the *Devil Lake route*, from the name of the lake on its summit, and is the route adopted. The line runs through wet and dry prairie and high white oak barren land, the soil of the former consisting principally of sand, and that of the latter of a mixture of sand, clay, and gravel.

This sub-division will be supplied by a short feeder from Yellow river; by the surplus water of sub-division 1st, and by a short cut from Devil Lake. The surface of this lake lies rather more than five feet above the bottom of the canal, and was found to contain 7,313,833 square yards, affording a natural reservoir furnishing the very large amount of 12,169,721 cubic yards of available water. Yellow river was estimated to discharge 12 cubic feet per second; but it will hardly yield that quantity during the dry season. The supply derived from these several sources will be abundantly sufficient to feed the canal until it reaches the Tippecanoe. No estimate has been made for these feeders, but the omission will not affect the general truth, inasmuch as a saving of equivalent amount will, it is thought, be produced by the improvements in the location of the line.

#### SUMMARY OF THE SECOND SUB-DIVISION.

Route.	Distances.		Descent.	No. of Locks.	Estimate.
	M.	Yds.	Feet.		
Mek-sin-kuk-keek	23	578	32	4	\$317,285 72
Devil Lake	9	1140	none	none	193,134 45
	13	1198	32	4	\$124,151 27

Difference in favor of Devil Lake route.

#### Summary of Middle Section.

Length 47 miles, 490 yards—Estimate \$550,136 51

The Southern Section commences at the intersection of the line with the Tippecanoe river. From this point, the canal follows the right

bank of that stream to where the Motimonon falls into it; here it crosses, and is then carried down the left bank, to the junction of the Tippecanoe, with the Wabash.

This section will have to depend for its supply, upon the Tippecanoe, which yielded at a short distance below where the line skirts its valley, two hundred and seventy feet of water per second, which quantity may be considered about its medium discharge.

*Sub-division 1st*—from the southern end of the Middle Section to the Motimonon.

Distance 36 miles 1,318 yards, Descent 64 feet—8 locks.

From Base Mark 84 miles 48 yards, Descent 64 feet—8 locks.

This sub-division continues throughout its whole length, on the right bank of the river; the soil is principally sand occasionally intermixed with clay and gravel, and the excavation will be of the easiest kind. Some paving and walling will be required along steep bluffs to protect the canal from injury by the freshets, which in this river rise very high. A dam must be erected across the Tippecanoe at the beginning of this sub-division, which will give water sufficient to feed the canal all the way to the Motimonon.

The estimate for this sub-division, amounts to \$271,198 12.

Upon reaching the Motimonon river, which discharges itself into the Tippecanoe from the west, it was thought best to cross this latter stream by a dam, and to carry the canal down its left bank.

This course is believed to present several advantages. It would have required a long aqueduct and a heavy embankment to take the canal over the Motimonon; the right bank of the Tippecanoe presented us facilities for the construction of the work which did not equally exist upon the left bank; added to which was the consideration that at its termination, the canal, if carried down the left bank would discharge itself into a basin to be formed for the Erie and Wabash canal, a work which is to debouch at the same point; whereas had the right bank been followed, the expense of an aqueduct to connect the canal, or of a separate basin would have been required, as well as a dam lower down, to feed the canal to its mouth. According to the course adopted, we cross the Tippecanoe by a dam, which will be sufficient to feed the canal the whole length, and avoid the construction of an aqueduct over the Motimonon, and either a basin or an aqueduct across the Tippecanoe at the end.

After crossing over to the left bank, an experimental line was run, to ascertain the practicability of uniting the present line with the line run for the Erie and Wabash canal. It was thought that if this should be practicable, the additional expense per mile in the construction would be more than counterbalanced by the difference in the length of the lines. The experimental line was accordingly carried up the valley of a small run, with the view of ascertaining the height of the dividing ridge between the Tippecanoe and Wabash rivers and their distance apart: but it was found that the distance was much greater and the cutting much deeper than had been anticipated, amounting to thirty-nine feet, with a prospect of further rise. This route was



therefore abandoned, and the line carried down to its termination at the mouth of the Tippecanoe, forming the second sub-division.

*Sub-division 2d*—from the Motimonon to the debouch of the canal into the Wabash at the mouth of Tippecanoe.

Length 30 miles 1533 yards, descent 107 feet—13 Locks.

From base Mark 114 miles 1581 yards, descent 171 feet—21 Locks.

The soil on this sub-division does not differ materially from that of the preceding one, consisting generally of sand, clay, and gravel. The bluffs of the river are steep, and in many instances very high, and approach so near the water as to occasion the necessity of a large quantity of walling and paving to protect the canal from the action of the stream. These circumstances together with the great number of locks that will be required, enhance the cost of this sub-division very considerably.

As has been stated, the dam, by which we cross the Tippecanoe, will be sufficient to supply this portion of the canal.

The estimate for this sub-division amounts to \$472,327 99.

#### SUMMARY OF SOUTHERN SECTION.

<i>Sub-division.</i>	<i>Distances.</i>		<i>Descent.</i>	<i>No. of Locks.</i>	<i>Estimate.</i>
	M.	Yds.	Feet.		
First	36	1318	64	8	\$271,193 12
Second	30	1533	107	13	472,327 99
	67	1091	171	21	743,526 11

#### SUMMARY OF SOUTHERN ROUTE.

<i>Section.</i>	<i>Distances</i>		<i>Ascent and Descent.</i>	<i>No. of Locks</i>	<i>Estimate.</i>
	M.	Yds.	Feet.		
Kankakee Feeder	7	1707			\$ 121,367 14
Northern Section	42	0895	127	16	480,875 18
Middle Section	47	0490			550,136 51
Southern Section	67	1091	171	21	743,526 11
	157	716	291	36	1,895,904 88

#### NORTHERN ROUTE.

Having thus endeavored to give a general description of one of the routes ordered to be examined, it now remains that some account should be given of the result of our labors upon the other.

From the same absence of all sources of accurate information, similar difficulties presented themselves upon this, as were experienced upon the southern route. Some time was occupied in exploring the country, and ascertaining its shape and topography, and the most fa-

avorable point at which a suitable connection could be formed between the St. Joseph of Lake Michigan and the St. Joseph of the Maumee, the second mode of communication designated by the board.

It was found that Pigeon river, a considerable branch of the St. Joseph (of the Lake) derived its source from a cluster of lakes, in one of which Fish creek, a stream discharging itself into the St. Joseph of the Maumee, also took its rise. Experimental lines were run over the summit dividing these lakes, the result of which was a determination to prosecute the surveys with a view to the connection by means of these two streams. A series of levelings was accordingly commenced at the head of Pigeon Lake (one of the cluster just referred to) and the source of Pigion river, and carried over the summit dividing that lake from another called Camp Lake, whence issues a small stream, which discharges itself into Little Fish lake, another of the group, and the spring head of Fish creek. From Fish lake the line descends the valley of this last mentioned stream until it strikes that of the St. Joseph of the Maumee, which river it follows to the termination.

Returning to the summit and proceeding West, the line follows the valley of Pigeon river to its junction with the St. Joseph (of the Lake) when it is carried down this stream nearly to its mouth.

With this general sketch of the mode of communication, we will proceed to examine the line in detail, observing that this route is divided into three sections, viz:

*Eastern Section*—From six miles above Fort Wayne, to a little below the junction of the St. Joseph of the Maumee with Fish creek.

*Middle Section*—From the mouth of Fish creek to Deer Lake on Pigeon river.

*Western Section*—From Deer Lake to the debouch of the canal into the St. Joseph (of the Lake.)

## MIDDLE SECTION.

The survey of that part of this section which was made in 1829, was entrusted to Mr. George Smith, the principal Assistant of the party from whose report to me in regard to it, the following extract is given:

"A line was commenced at Pigeon lake, assuming a base line four feet below its source, and carried over the summit between that lake and Camp lake, a distance of 13.3 miles with deep cutting, the average depth of which will be fifteen feet. On reaching Camp Lake, a lock of nine feet was dropped, which brought the base line four feet below its surface. The line was carried on from the lower end of the lake with the same base down the east side of the summit, to Little Fish Lake, (a distance of one and a half miles) with a descent of 59 feet, by 7 locks, reaching that lake with a base 4 feet below its surface. The line was then carried down the valley of Fish creek to bench mark 2, where it was taken up by yourself and prosecuted until you were stopped by the inclemency of the weather."

"The line down the western side of the summit, commences at the lower end of Pigeon lake, with a base four feet below its surface.



Proceeding down the valley of Pigeon river, that stream was discovered to pass through the lower end of Long Lake, whose surface was 3.72 below the base line, making it 7.72 below Pigeon lake. The base was accordingly lowered eight feet, making the lake's surface  $\approx 4.28$ . With this arrangement the lake was intended to be taken in as a feeder, and thus obviate the necessity of crossing the river by an aqueduct. An ordinate was also run, the main line shewing the facility with which Pigeon lake and Long lake could be connected."

"The line was then carried on from Long Lake, crossing the outlet from Fire lake and continues in the valley of the river until it reaches the next lake below, around which it passes, and reaches the bank of the river a little below Hog-back lake, at the outlet of which bench mark V is established at the end of 94 miles. The channel of Pigeon river from Long Lake to Hog-back Lake is very deep and the valley narrow, with the exception of the space between Hog-back and the lake immediately above it, where the valley widens over a wet prairie of considerable extent. The river at the outlet of Hog-back lake, has the appearance of being raised by freshets two feet."

"From bench mark V, the line was carried down to the end of 144 miles, where the river passes through another lake, about the size of the two last above, where it became necessary to cross the stream twice. At the distance of 21 3-8 miles, the line crosses a stream which forming a junction with Pigeon river, increases its discharge very considerably."

"The line was terminated on account of the advanced stage of the season, on the banks of Deer Lake, a distance from the summit of 30 miles and 63 chains."

"From Hog-back lake the ground over which the line passes, is highly favorable, generally a barren sandy soil, with the exception of a small proportion of prairie. I am of opinion that to effect the most judicious location, the line should follow the right bank of Pigeon river. At the time the survey was commenced, no important information could be gained in relation to the valley of the river, farther than was developed as the work progressed."

"At first view, the resources of water for the supply of the summit level agreeably to the discharge of the streams that have been gauged, would in all probability appear insufficient to remove such an impression, the following plan is respectfully suggested:"

"It will be observed that Hog-back lake is not quite three fourths of a foot lower than Long lake and 8.42 below Pigeon lake. It will therefore be seen, that by erecting a dam across Pigeon river at the outlet of Hog-back lake, the backwater would be on a level with Pigeon lake; the small lake at the Hog-back, would be 1.46 above that level, the large lake north east of it would be  $\approx 1.46$ , and Wood lake would be 244 feet above the same level."

"The following streams were gauged by a dam:

Fish creek at outlet of the Lake	1.14 feet per second;
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" " near bench mark II,	1.48 " "
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Pigeon river above Long lake	1.26 " "
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" " at the second crossing	16.14 " "	" "
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From the above remarks of Mr. Smith, it will be seen that it is not contemplated by him to construct a canal from Pigeon lake to Hog-back lake, but to form a slack-water navigation for that distance and the reservoir formed by the dam at Hog-back lake he deems to be sufficient to feed, each way from the summit, until the waters of the St. Joseph (of Maumee) can be commanded, on the one hand, and those of Pigeon river on the other at a point lower down, where from a variety of sources it has received supplies sufficient to enable it to feed without difficulty.

A personal and more careful examination, however, in the spring following, resulted in strong doubts as to the fact that the reservoir thus filled would be sufficient to feed the series of locks on the eastern side of the summit, from Pigeon lake to Little Fish lake, which being so close together would make heavy drafts upon its resources.

Fortunately, however, this fundamental question can by a cheap and easy experiment be speedily determined. But in order to understand this, some preliminary explanations are necessary.

The country around the summit level abounds in small lakes, from a half to two miles in length, either connected together in chains, or separate and alone, without any apparent inlet or outlet. They consist of the purest spring water, are full of the finest fish, and are of immense depth; in one of them, the bottom, as I have been informed, was sought in vain with a line of 250 yards. The soil of the surrounding country is a mixture of sand, clay, and gravel, indicating a bed of clay. Their supply from beneath being constant, they do not appear to be affected by the drought of summer, but where there are outlets, these are considerably swollen by the melting of the snow and ice on their banks, in the spring.

The experiment then will consist in ascertaining whether the waters of one of these lakes cannot be availed of as auxiliary to the reservoir proposed by Mr. Smith.

Pleasant Lake (map sheet No. 1, northern route) lies about half a mile south of Pigeon lake, and has evidently no communication with it, or with Long lake, to which it is still more contiguous (being 4.94 above the former and 8.76 above the latter.) It has in fact no apparent inlet or outlet. By a careful survey, its surface was found to contain 99,272 square yards, which multiplied by 4.94 (its height above Pigeon lake) will give us 163,467.24 cubic yards of available water. Now we know that in wells and reservoirs which receive their supply from subterraneous sources, the water rises, until the upward pressure is counterbalanced by that of the atmosphere, and by the weight of the superincumbent water. Suppose then a drain to be cut from Pleasant lake, (which can be done at a very trifling expense) three feet wide and extending only two feet below the surface of the water, the discharge from it (supposing the supply to be constant) will not be short of 23 cubic feet per second, and should such a drain be opened, the only question will be whether the supply from below will be sufficient to replace the water thus taken away from above, without suffering the lake materially to diminish. This can be ascertained by experiment.

alone. Should such prove to be the case, it is believed that this quantity added to the supply furnished by the proposed reservoir will be sufficient for the supply of this summit. But should our expectations from this source not be realized, it will then be proper to make some farther examination north of the summit, whence it is believed water may be obtained from the head sources of Crooked creek, and of Cold water, in sufficient quantity.

I now proceed to a description of the route in detail.

## EASTERN PORTION.

This part of the middle section extends from the head of Pigeon lake to the dam on the Little St. Joseph below the mouth of Fish creek.

Distance 19 miles 28 yards—descent 138.39 by 17 locks.

Deep cutting occurs on the first part of this sub-division over the summit between Pigeon lake and Camp lake, varying from 12 to 22 feet for three fourths of a mile. The line enters Camp lake by a lock of 9 feet lift. This lake forms a splendid natural basin, being nearly circular, and rather more than one-fourth of a mile in diameter.

From Camp Lake the ground descends very rapidly to Little Fish Lake, a distance of one and a half miles, with a fall of fifty-nine feet by seven locks. By a little altering the location of this part of the line, an improvement may be made in the location of these locks, the ground admitting of their being distributed at proper intervals between the lakes.

It is proposed, in order to prevent waste of the water drawn from the summit level by the series of locks above mentioned to erect a dam across the outlet of Little Fish Lake, nine feet high, thus forming a large reservoir, for which the make of the ground seems admirably adapted. By a careful survey it was ascertained that this lake contained 373,452 square yards, which will give by means of the dam of nine feet, at least 1,120,000 cubic yards of water for the supply of the canal as far as the Little St. Joseph.

The outlet of this lake was gauged in August, 1830, when its discharge was found to be much greater than in the year preceding and amounted to 18.64 cubic feet per second while the discharge into it on the same day from three small spring branches, amounted only to 4.94. The supply therefore accruing from subterraneous sources was 13.70 cubic feet.

From the number of ravines which will discharge water into this lake, and the sloping of the ground generally toward it, no doubt is entertained that the reservoir thus formed, would be filled up in the winter during the interruption of the navigation.

A case came under our own observation, where a dam having been erected across the outlet of a lake similar in its characteristics, the water rose to the level of the top of the dam and afforded a very good mill-seat.

From Fish Lake the line follows the valley of Fish creek through heavily timbered land with generally rich alluvial soil, to a short dis-



tance below its junction with the little St. Joseph. The great number of locks upon this portion of the canal, together with the deep cutting over the summit swells the estimate considerably, raising it to \$187,545 86.

## WESTERN ROUTE.

This portion of the middle section extends from the head of Pigeon Lake to Deer Lake, and continues two subdivisions.

*Subdivision 1st*—(Map sheet 1, "Northern route") from Pigeon Lake to Bench Mark 5 at Hogback Lake.

Distance 9 miles 623 yards.

Although the line on this subdivision was originally run with a view to the construction of a canal its distance, yet the result of the examination was such as to convince us that a slackwater navigation formed in the manner described before, was preferable, and presents, in fact, the only mode by which the summit level can be supplied. Should this course be adopted, the lock heretofore dropped within this subdivision, must be thrown further down, and is, accordingly included within the second subdivision. The summit level thus extended reaches from Camp Lake, on the eastern to Hogback Lake on the western side of the summit a distance of 10 miles 1145 yards. It was determined therefore to adopt the distance of the line thus originally run for the canal, as the length of a tow-path and tow-path bridge, which will, in that case be necessary. A slight reference to the map of this part of the survey will shew that the length of this tow-path may be considerably shortened, whilst at the same time it can be made to pass along the margin of five lakes affording the convenience of so many natural basins. This tow-path and bridge can, it is believed be constructed for less than \$4,000 per mile. Timber of an excellent quality is to be had in the greatest abundance conveniently to the line.

The whole estimated cost of this subdivision amounts to \$47,041 75.

*Subdivision 2d*—From Hogback Lake to the dam across Pigeon river below Deer Lake.

Distance 25 miles 70 yards, descent 118.57 feet 15 locks.

From Pigeon Lake 34 miles 693 yards.

The ground upon this subdivision is generally favorable and the excavation easy. A considerable quantity of embankment occurs, which however may be avoided by a different location of the locks. Two aqueducts across Pigeon river will be required but they are short. From the great fall in the ground, an unusual number of locks will be required averaging about one to every one and three-fourth miles. On reaching Deer Lake the canal passes through it by a tow-path bridge 181 yards long, by which means the necessity of twice crossing Pigeon river is avoided; this subdivision terminates a short distance below, and according to the estimate herewith submitted will cost \$245,479 71.

## SUMMARY OF MIDDLE SECTION.

Portion.	Distances.		Descent.	No. of Locks.	Estimates.
	Miles.	Yards.	Feet.		
Eastern portion	19	28	138.39	17	187,545 86
Western portion	34	693	118.57	15	292,521 46
	53	721	256.96	32	\$480,067 32

## WESTERN SECTION.

From Deer Lake to the termination of the line near the mouth of the St. Joseph (of the Lake;) Map sheet No. 3, "Northern route."

This rection will be supplied with water, 1st by a dam at its commencement and Pigeon river, and by a dam across the St. Joseph of the Lake on the second subdivision.

*Subdivision 1st*—From the dam across Pigeon river below Deer Lake to the crossing of the Little Elkhart; (Map sheet No. 3.)

Distance 22 miles 1,179 yards—descent 80 feet—10 locks.

From Pigeon Lake 57 miles 112 yards—descent 198.57 ft.; 25 locks. This subdivision runs for the most part through high white-oak barrens, with some prairie and a fine sandy soil, occasionally intermixed with gravel and clay. It follows the valley of Pigeon river until its discharge into the St. Joseph, when it descends the latter stream to the Little Elkhart, which it crosses by an aqueduct of 193 yards in length. The cost of this subdivision will be enhanced by some pretty heavy embankments which occur, over wide depressions, and one across the bottom of the Little Elkhart. This subdivision is to be fed from Pigeon river, by a dam seven feet high, and three hundred and seventy feet long at the top.

The estimated cost amounts to \$194,088 17.

*Subdivision 2d*—From the crossing of the Little Elkhart to the head of the feeder for the supply of the Kankakee summit on the southern route.

Length 19 miles 875 yards—descent 48.31—6 locks.

From Pigeon Lake 76 " 987 " " 246.88 31 "

This subdivision will be very expensive. For the first three miles the line runs through elevated table land that for the most part extends quite up the river, presenting high wash banks. The cutting for this distance will be tolerably deep, averaging  $7\frac{1}{2}$  feet. The excavation, however, is of the easiest kind. Long and high embankments will also be required across the valley of the Big Elkhart river, and those of the Ba-ba-go and Twin creeks; together with an aqueduct over each of these streams. These however will be short. Some steep side-cutting will be necessary; and in some cases paving and a good deal of walling will be requisite to support the canal under high and steep bluffs. These circumstances will greatly enhance the cost of this part of the work.

The first five miles of this subdivision will be supplied from the feed-



er of subdivision 1st, after which it was at first contemplated to procure a supply from the St. Joseph, by a dam eight feet high and 563 feet long. It is believed, however, that the Elkhart river will be preferable for this purpose, as its discharge will be sufficient and the expense of converting it into a feeder will not be so great.

This subdivision is connected with the head of the feeder for the Kankakee summit by a lock 9.51 feet. That feeder, together with the whole Northern section of the Southern route constituting a continued line of levels from this point to the debouch of the canal into the St. Joseph, they are adopted as the remainder of this section, and their expense must of course be added as a part of the estimate for the Northern route. Should this latter route be the adopted mode of connecting Lake Michigan with the Wabash, another dam will have to be erected across the St. Joseph, at some point lower down in order to feed the canal to its termination.

The whole estimated expense of this subdivision according to the accompanying documents amounts to \$223,679 57.

#### SUMMARY OF WESTERN SECTION.

Subdivision.	Distance.	Descent.	No. Locks	Amount.
First	22.1179	80.	10	\$194,088 17
Second	19.875	48.31	6	223,679 57
(Kankakee feed.) Third	7.1707			121,367 14
Northern route { Fourth	11.000	16.	2	83,024 14
of the { Fifth	18.621	32.	4	224,191 62
Southern sect. { Sixth	12.1034	79.87	10	173,659 42
	M. Yds.	Feet.		
	92 1136	256.18	32	\$1,020,010 06

#### EASTERN SECTION.

This section comprehends that part of the canal carried down the valley of the St. Joseph (of the Maumee) and extends from a short distance below the mouth of Fish creek to six miles above Fort Wayne. It is divided into two subdivisions.

*Subdivision 1st*—From a short distance below the mouth of Fish creek to Bench Mark 23. (Map sheet No. 2, "Northern route.")

Distance 11 miles 1210 yards—descent 16 ft.—2 locks.

From Pigeon Lake 33 " 1238 " " 154 " 19 "

This subdivision commences with a dam across the St. Joseph, eight feet in height and one hundred and fifty-four feet long. The line runs through rich alluvial land requiring very heavy grubbing. Side cutting and walling will be necessary, as well as a considerable quantity of paving to protect the embankments from injury by the freshets.

The estimate for this subdivision amounts to \$174,072 60.

*Subdivision 2d*—From Bench Mark 23 to the termination of the canal about six miles above Fort Wayne,

Length 16 miles 1585 yards—descent 24 ft.—3 locks.

From Pigeon Lake 50 " 1063 " " 178 " 22 "

This subdivision does not differ materially in its character from the preceding, except that it will require four aqueducts to pass the canal over deep ravines, and one to cross Cedar creek. This stream can also be used as a feeder.

The line terminates at the head of the feeder for the contemplated canal to connect Lake Erie with the Wabash river, as run under the direction of Commissioners, appointed by the State of Indiana. The estimate for this subdivision is \$186,318 09.

### SUMMARY OF EASTERN SECTION.

<i>Subdivisions.</i>	<i>Distances.</i>	<i>Descent.</i>	<i>Locks.</i>	<i>Estimate.</i>
First	14.1210	16	2	174,072 60
Second	16.1585	24	3	186,318 09
	31.1035	40	5	\$360,390 69

### SUMMARY OF NORTHERN ROUTE.

<i>Section.</i>	<i>Distances.</i>	<i>Descent.</i>	<i>Locks.</i>	<i>Estimate.</i>
Eastern	31.1035	40.	5	360,390 69
Middle	53.721	256.96	32	480,067 32
Western	92.1136	256.13	32	1,020,010 06
	177.1132	553.14	69	\$1,860,468 07

According to the above estimates it will be perceived that a small difference exists in favor of the "Northern route:" but it must be remembered that the estimate does not include the whole length of that route as ordered by the original instructions in relation to this communication.

It is an estimate of that portion of it only which extends from the mouth of the St. Joseph (of the Lake) to Fort Wayne—and it proceeds on the assumption that the residue of the route, viz: from Fort Wayne to the mouth of the Tippecanoe, will be constructed as a part of a different work, viz: the Erie and Wabash Canal. Should that work not be constructed, the cost of 106 miles more of canal, amounting to the estimate of Commissioners appointed for that purpose by the State of Indiana, to \$922,000, will have to be added, which will cause the total expense of the Northern very considerably to exceed that of the Southern route, thus removing the solitary ground of preference, which can be urged in favor of the former.

But leaving this advantage untouched, and taking it for granted that the remaining 106 miles, will be constructed out of other funds, there still remain considerations, which, it is believed, will more than counterbalance this trifling difference in the original cost of the canal.

The southern route is shorter by more than twenty miles: it has less lockage by 262 feet; it will require but 36 instead of 69 locks, thereby occasioning a great saving of time in the transportation of all articles of trade; and lastly and principally, it enjoys the paramount advantage of commanding an unfailing and ample supply of water on the summit.

For these reasons the preference has without hesitation been given to the Southern route.

In closing this report, I should do injustice to my own feelings were I to omit to mention the important services rendered by the assistants who have been engaged upon the several parts of this survey.

To Philip R. Vanwyck, Esq., U. S. Assistant Civil Engineer, was committed the task of carrying the entire line of levels down the valleys of the St. Joseph and Tippecanoe rivers, in which service he was assisted by Mr. Charles Mortimer.

The diligent and faithful manner in which this part of the survey was executed, is such as so reflect upon Mr. Vanwyck the highest credit.

The levellings down the valley of the Kankakee and over the summit of the northern route, were executed by Mr. George Smith; and from that summit down the valleys of both the St. Joseph rivers, by Mr. Erskine Stansbury, aided by Mr. Randolph Coyle.

The prosecution of this extensive survey, by subjecting to minute inspection a very interesting portion of our country, has tended entirely to confirm the views in which the examination had its origin. It has conducted the brigade through a region abounding in every natural advantage, fertile in soil, presenting great facilities of communication, and lying immediately adjacent, on one side, to a stream which will soon be rendered navigable throughout its length, and covered with the bustle of an active trade; and, on the other, to a great arm of our Mediterranean waters, stretching itself into the very heart of a rich and (soon to be) a populous country, and furnishing for the naval defence of our internal frontier a safe and convenient harbor, easily fortified, and affording every possible advantage for a naval depot. The means of uniting the two have now been sufficiently developed to render it certain that that valuable improvement may be effected at a small comparative expenditure of money and labor, and a path has been fully opened for the enterprise of a young but rapidly advancing state.

All which is respectfully submitted,

(Signed)

HOWARD STANSBURY,

U. S. Ass't Civil Engineer.

Washington, Oct. 7, 1831.



186 009'96

EXCAVATION.

EMBANKMENT.

AQUED. CULVERTS.

Distance	Dist. in yds.	Redu. Area S. Y.	Cub. Yds.	Price.	Amount.	Dist. in Yds.	Redu. Area S. Y.	Cub. yards.	Price.	Amount.	Amount.	Price.	No.	TOTAL.
13	813	9.3	7,585	13	986 05	813	2.3	1,911	16	305 76				1,291 81
16	1,263	23.8	30,109	13	3,914 17									3,914 17
28	1,542	36.7	56,591	16	9,054 56									9,054 56
39	1,641	48.7	79,716	16	12,754 56									12,754 56
192	1,213	69.9	84,788	19	16,109 72									16,109 72
219	1,187	94.9	112,646	19	21,402 74									21,402 74
235	1,726	66.9	115,649	19	21,973 31									21,973 31
247	1,922	30.5	58,793	16	9,406 88									9,406 88
254	2,927	45.5	133,178	16	21,308 48									21,308 48
254	2,860	16.3	46,789	10	4,678 90									4,678 90
239	3,697	17.2	63,699	13	8,280 87									8,280 87
247	1,376	9.2	12,072	13	1,647 36	1,376	2.3	4,333	22	953 26				2,600 62
246	4,579	11.3	51,834	13	6,738 42									6,738 42
281						1,035	52.9	54,782	22	12,052 04				12,052 04
258	3,096	6.5	20,267	13	2,634 71									2,634 71
261	1,963	5.3	10,521	13	1,367 73	1,963	20.8	40,928	16	6,548 48				7,916 21
266						545	55.4	30,193	19	5,736 67				5,736 67
241	1,555	31.	48,205	13	6,266 65	633	40.8	25,826	19	4,906 94				11,173 59
263	789	14.8	11,677	13	1,518 01									1,518 01



The southern route is shorter by more than twenty miles: it has less lockage by 262 feet; it will require but 36 instead of 69 locks, thereby occasioning a great saving of time in the transportation of all articles of trade; and lastly and principally, it enjoys the paramount advantage of commanding an unfailing and ample supply of water on the summit.

For these reasons the preference has without hesitation been given to the Southern route.

In closing this report, I should do injustice to my own feelings were I to omit to mention the important services rendered by the assistants who have been engaged upon the several parts of this survey.

To Philip R. Vanwyck, Esq., U. S. Assistant Civil Engineer, was committed the task of carrying the entire line of levels down the valleys of the St. Joseph and Tippecanoe rivers, in which service he was assisted by Mr. Charles Mortimer.

The diligent and faithful manner in which this part of the survey was executed, is such as so reflect upon Mr. Vanwyck the highest credit.

The levellings down the valley of the Kankakee and over the summit of the northern route, were executed by Mr. George Smith; and from that summit down the valleys of both the St. Joseph rivers, by Mr. Erskine Stansbury, aided by Mr. Randolph Coyle.

The prosecution of this extensive survey, by subjecting to minute inspection a very interesting portion of our country, has tended entirely to confirm the views in which the examination had its origin. It has conducted the brigade through a region abounding in every natural advantage, fertile in soil, presenting great facilities of communication, and lying immediately adjacent, on one side, to a stream which will soon be rendered navigable throughout its length, and covered with the bustle of an active trade; and, on the other, to a great arm of our Mediterranean waters, stretching itself into the very heart of a rich and (soon to be) a populous country, and furnishing for the naval defence of our internal frontier a safe and convenient harbor, easily fortified, and affording every possible advantage for a naval depot. The means of uniting the two have now been sufficiently developed to render it certain that that valuable improvement may be effected at a small comparative expenditure of money and labor, and a path has been fully opened for the enterprise of a young but rapidly advancing state.

All which is respectfully submitted,

(Signed)

HOWARD STANSBURY;

*U. S. Ass't Civil Engineer.*

*Washington, Oct. 7, 1831.*

SOUTHERN ROUTE—Northern Section, Subdivision 2, from a little below Niles to Bench Mark xx.

[illegible]

SOUTHERN ROUTE—Northern Section, Subdivision 3, from B. M. xx to the termination of the line near the mouth of the St. Joseph.

EXCAVATION.				EMBANKMENT.				WALLING.				LOCKS.				CULVERTS.				PAVING.			TOTAL.
Distance from Beginning.	Length of Portion.	Dist. in yds.	Redu. Area S. Y.	Cub. Yds.	P. rice.	Amount.	Dist. in yds.	Redu. Area S. Y.	Cub. Yds.	Price.	Amount.	Dist. in yds.	Redu. Area S. Y.	Cub. Yds.	Price.	Amount.	No.	Price.	Sqare Yds.	Amount.			
257	257	606	12	7,272	16	1,163 52	237 46	11,822 19	221 38														
156	863	1,019				1,163 52	156 25	3,000 23	858														
174	1,193	2,081	11	3,550	23	14,377	162 403	65,350 23	14,377														
2,098	1,492	2,081	35	462	23	8,865 30	1,251 26	32,528 23	7,155 72														
1,231	1,985	700	41	28,700	15	4,393	783 2	985	1,308 91														
1,112	2,117	1,412	10	8,123	16	2,138 84																	
1,713	4,001	1,743	47	81,921	16	13,107 36																	
817	1,845	847	35	20,645	16	4,713 30																	
2,246	5,434	2,516	42	98,632	19	18,721 08																	
610	6,284					610 18																	
905	6,190	906	74	67,044	16	10,727 04																	
1,935	6,129	1,329	11	1,529	13	198 77																	
563	7,291	520	10	4,501	13	715 12																	
331	7,622					331 61																	
1,072	7,635	1,073	10	8,158	13	1,516 44																	
769	8,701					917 8																	
917	8,1618					1,549 73																	
300	9,158					917 13																	
277	9,435	277	13	3,656	13	475 98																	
9,019	10,687	2,012	11	28,168	13	3,661 84																	
1,261	11,188					3,337 80																	
2,000	12,103	2,006	10	26,060	13																		
						\$75,863 33																	
						\$10,890																	
						\$12,890 50																	
						\$22,854 50																	
						\$1,542																	
						\$173,639 42																	

[illegible]



rn Sect

EMBANKMENT

Cubic Yards.	Price.
12,105 16	
46,376 16	
35,834 16	
11,918 13	
13,967 13	

# SOUTHERN ROUTE--Southern Section--S

EXCAVATION.						EMBANKMENT		
Price.	Cubic Yard	Red. area s.	Dist. in Yar	Amount.	Price.	Cubic Yard	Red. area s.	Dist. in Yar
Distance from beginning.						Length of position.		

13	25	17,321 93
		12,255 37
		22,174 81
		9,567 37
		2,528 24
19	50	271,198 12



[illegible]

Yellow river.

11

## MICHIGAN AND WABASH CANALS.

1. The first part of the document is a list of names and titles, including "The Hon. Mr. Justice" and "The Hon. Mr. Justice".

5,300 29		\$240,620 10				
124,924 28					\$2,159 84	
						\$5,600 \$247,939 84

## Division 2—Summit between Yellow river and the Tippecanoe Route—(adopted.)

12,304 16	10.4	2,444 13	737 18.7	13,781 19	2,618 39	2,618 39
18,683 165	17.20	34,761 13	613 33.6	20,590 19	3,913 24	6,413 24
9,296 121	94.53	150,019 16				317 72
5,280 157	125.8	282,121 22				4,518 93
9,184 165	105.5	106,977 19				24,003 04
71,840 164	80.4	171,975 16				62,132 62
9,702 129	63.2	193,960 16				20,325 63
2,706 129	37.9	89,904 13				27,516
25,017 123			1027 18.	18,486 16	2,957 76	31,033 60
16,800 13						11,297 52
10,857 19						2,957 76
4,720 16						
						\$193,134 45



rn Section

BANKMENT.

Cubic Yards.	Price.
12,195 16	12,195 16
46,376 16	46,376 16
35,834 16	35,834 16
11,913 13	11,913 13
13,967 13	13,967 13
18,007 10	18,007 10

2 0 4 0 5









Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																																																																																																																																																																															
12,304 16	18,683 15	9,296 14	5,280 13	9,184 12	71,840 11	9,702 10	2,706 9	25,017 8	16,800 7	10,857 6	4,720 5	184,463	124,924 2	5,300 2	2,650 1	23,261 0	7,029 0	30,172 0	12,304 0	18,683 0	9,296 0	5,280 0	9,184 0	71,840 0	9,702 0	2,706 0	25,017 0	16,800 0	10,857 0	4,720 0	184,463	124,924	5,300	2,650	23,261	7,029	30,172	12,304	18,683	9,296	5,280	9,184	71,840	9,702	2,706	25,017	16,800	10,857	4,720	184,463	124,924	5,300	2,650	23,261	7,029	30,172	12,304	18,683	9,296	5,280	9,184	71,840	9,702	2,706	25,017	16,800	10,857	4,720	184,463	124,924	5,300	2,650	23,261	7,029	30,172	12,304	18,683	9,296	5,280	9,184	71,840	9,702	2,706	25,017	16,800	10,857	4,720	184,463	124,924	5,300	2,650	23,261	7,029	30,172	12,304	18,683	9,296	5,280	9,184	71,840	9,702	2,706	25,017	16,800	10,857	4,720	184,463	124,924	5,300	2,650	23,261	7,029	30,172	12,304	18,683	9,296	5,280	9,184	71,840	9,702	2,706	25,017	16,800	10,857	4,720	184,463	124,924	5,300	2,650	23,261	7,029	30,172	12,304	18,683	9,296	5,280	9,184	71,840	9,702	2,706	25,017	16,800	10,857	4,720	184,463	124,924	5,300	2,650	23,261	7,029	30,172	12,304	18,683	9,296	5,280	9,184	71,840	9,702	2,706	25,017	16,800	10,857	4,720	184,463	124,924	5,300	2,650	23,261	7,029	30,172	12,304	18,683	9,296	5,280	9,184	71,840	9,702	2,706	25,017	16,800	10,857	4,720	184,463	124,924	5,300	2,650	23,261	7,029	30,172	12,304	18,683	9,296	5,280	9,184	71,840	9,702	2,706	25,017	16,800	10,857	4,720	184,463	124,924	5,300	2,650	23,261	7,029	30,172	12,304	18,683	9,296	5,280	9,184	71,840	9,702	2,706	25,017	16,800	10,857	4,720	184,463	124,924	5,300	2,650	23,261	7,029	30,172	12,304	18,683	9,296	5,280	9,184	71,840	9,702	2,706	25,017	16,800	10,857	4,720	184,463	124,924	5,300	2,650	23,261	7,029	30,172	12,304	18,683	9,296	5,280	9,184	71,840	9,702	2,706	25,017	16,800	10,857	4,720	184,463	124,924	5,300	2,650	23,261	7,029	30,172	12,304	18,683	9,296	5,280	9,184	71,840	9,702	2,706	25,017	16,80

# ern Section—Subdivision 1—from Dam on the Little St. Joseph to B. M. xxiii.

EAKMENT.			WALLING.			LOCKS.			CULVERTS.			PAVING.			TOTAL.
Amount.	Price.	Cubic Yards.	Amount.	Price.	Cubic Yards.	Amount.	Price.	Lift in feet	No.	Amount.	Price.	Square yards.	Amount.	Price.	
12,195 16	1,951 20	46,376 16							1	250					6,594 16
46,376 16	7,420 16	35,834 16							1	300					8,143 31
									1	250					8,011 44
									1	250					4,951 32
11,918 13	1,549 34	13,967 13										936 75	702		7,715 30
13,967 13	1,815 71														3,032 51

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EDITOR'S OFFICE,  
Dec. 16, 1835. }

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serv't,

M. MORRIS,  
A. P. A.



NORTHERN ROUTE.—Middle Section.—Western Portion—Subdivision 2.—from B. M. v, on Pigeon River, to Deer Lake.

[illegible]

Subdivision 1, from Pigeon Lake to Hog-back Lake  
Dam across Pigeon River at Hog-back  
Tow-path bridge 16,463 yards at \$2.25

\* Brought down from Subdivision 1. (See Memoir.)

\$47,041 75

**NORTHERN ROUTE—Western Section—Subdivision 1**—from the Dam below Deer Lake to the crossing of the Little Elkhardt.

[illegible]

**NORTHERN ROUTE**—Western Section—Subdivision 2—from the Little Elkhart to the head of the Feeder for the Kankakee summit.

[illegible]

NORTHERN ROUTE—Middle Section—Eastern Portion—from the head of Pigeon Lake to the dam on the Little St. Joseph, B. M. XII.

EXCAVATION.					EMBANKMENT.			LOCKS.			CULVERTS.		TOTAL	
Length of portion	Distance from beginning	Dist. in yards	Red. areas. y.	Cubic yards	Price	Amount	Dist. in yards	Red. areas. y.	Cubic yards	Price	Amount	No.		Price
828	838	830	95.1	21,031.3		2,734.03								2,734.03
639	1,407	630	54.7	41,341.6		6,614.88								6,614.88
385	1,703	236	47.3	34,681.9		6,627.20								6,627.20
119	1,397	336	95.1	31,671.6		5,100.48								5,100.48
491	1,838	491	43.4	15,321.3		3,332.32								3,332.32
1,275	2,403	1,039	14.7	16,257.13		3,880.80								3,880.80
611	3,123.4	4,033.7	17.3	69,711.3		1,985.49	1	9.33	350	3,265.50				5,250.99
738	6,233	768	19.2	14,551.10		1,455.30								39,993.86
1,036	6,132.6	930.37	25.1	14,143.3		3,264.30								1,455.30
409	6,166.4			1,943.32		1,943.30								4,273.38
302	7,730	307	19.2	5,894.3		766.22								1,043.00
1,632	7,113.8	668	12.7	8,481.3		1,102.79								1,374.78
2,008	6,166.6	888	11.1	9,950.3		1,281.28								1,016.22
473	8,339	473	11.3	5,581.3		725.53								1,102.79
471	9,030	471	37.4	17,614.3		2,289.95								15,517.84
581	8,142.1	591	16	9,945.3		1,329.38								725.53
598	10,107	496	35	12,400.42		1,984.00								2,289.95
545	10,300.5	348	37	12,674.18		1,673.88								1,329.38
1,258	11.13	1,011	34.4	35,031.3		4,560.53								1,984.00
619	11,632	595	16.9	6,534.13		1,109.43								1,673.88
1,266	12,138	1,081	15	16,213.3		2,407.92								6,357.17
1,829	12,153.0	1,315	32	42,084.13		5,470.40								1,922.86
871	13,641	602	24.3	14,624.13		1,901.64								7,468.32
1,413	14,294	936	20	18,520.13		2,407.60								4,250
2,064	15,539.8	1,689	24.6	41,549.13		5,401.37								4,773.45
6,470	19.38	6701	15	35,515.13		1,116.95								9,354.82
														15,467.62
														29,065.36
Tow-path bridge across Camp Lake 236 yards 531.00														
\$ 48,334.50														
\$ 3,500.00														
\$ 187,645.86														



NORTHERN ROUTE—Eastern Section—Subdivision 1—from Dam on the Little St. Joseph to B. M. xxiii.

EXCAVATION.						EMBANKMENT.				WALLING.				LOCKS.		CULVERTS.		PAVING.		TOTAL.						
Length of portion.	Distance from beginning.	Dist. in Yards.	Red. area s. y.	Cubic Yards.	Price.	Amount.	Dist. in Yards.	Red. area s. y.	Cubic Yards.	Price.	Amount.	Dist. in yds.	Red. area s. y.	Cubic Yards.	Price.	Amount.	No.	Price	Amount.		No.	Price	Amount.	Price.	Amount.	Price.
3087	1.1327	2816	12.	33,792	13	4,392 96	271 45.	12,195	16		1,951 20							1	250	250						6,594 16
713	2. 280	186	17.5	3,255	13	423 15	527 88.	46,376	16		7,420 16							1	300	300						8,143 31
3186	3.1706	1300	12.	15,600	13	2,028 00	1876 19.	5,834	16		5,733 44							1	250	250						8,011 44
871	4. 817	871	19.	16,549	13	2,151 37												1	8	350	2,800					4,951 32
2153	5.1210	1841	12.	22,092	13	2,871 96	312 38.2	1,918	13		1,549 34	216 4.	864 3	2,592									936 75	702		7,715 30
1469	6. 919	585	16.	9,360	13	1,216 80	884 15.8	3,967	13		1,815 71															3,032 51
1340	7. 331	1212	12.	8,500	13	1,091 74	1127 41.	6,207	13		6,172 33							1	800	800	1336 75		1002			16,923 02
2594	8.1341	1699	14.2	24,125	13	3,136 25	395 38.3	4,278	14		5,484 48	266 3.3	877 3	2,631				3	250	750	1800 75		1350			13,351 73
758	9. 339	352	19.	6,688	13	869 44	406 36.5	4,819	19		2,815 61															3,685 05
2515	10.1094	1418	14.5	20,561	13	2,672 95	1097 44.5	8,816	13		6,346 08	872 4.7	4,098 3	12,294				{2 250}								
																		{1 800}								
1539	11. 873	1011	13.	18,198	13	2,365 74	528 32.	16,896	13		2,196 48	570 8.	4,560 3	13,680				3	250	750	584 75		438			19,430 22
2117	12.1230	1119	15.	16,785	13	2,182 05	998 28.7	28,642	16		4,592 72	616 3.3	2,032 3	6,096				3	250	750	685 75		513 75			14,124 52
2011	13.1481	1174	16.3	19,136	13	2,487 68	837 80.	66,960	22		14,731 20	959 3.3	3,164 3	9,492				1	800	800						30,310 88
1489	14.1210	530	14.5	7,685	13	999 05	959 26.	24,934	16		3,989 44							1	250	25 0	287 775		2,157 75			7,717 78
																								Dam and feeder		7,250 00
						\$28,889 12					\$67,395 19			\$52,035			\$5,600					\$6,250		\$6,331 75	\$174,072 60	

# NORTHERN ROUTE—Eastern Section—Subdivision 2.—Line down the Little St. Joseph—from B. M. 25 to the termination of the line.

EXCAVATION.										EMBANKMENT					WALLING.					AQUEDUCTS.		LOCKS.			CULVERTS.			PAVING.			TOTAL.																
Length of portion	Distance from beginning.	Dist. in yards.	Red. area. y.	Cubic Yards	Price	Amount	Dist. in yards	Red. area. y.	Cubic yards	Price	Amount	Dist. in yards	Red. area. y.	Cubic yards.	Price	Amount	Length in yds.	Amount.	No.	Price	Lift in feet.	Amount.	No.	Price	Amount	Square yards	Price	Amount																			
3196	1.1436	2119	12.6	26,699	13	3,470	87	1077	47.8	51,180	16	236	80	420	3.3	1,386	3	4,158						3	266	800	831	75	623	25	17,288	92															
2996	3. 912	2451	15.5	37,990	13	4,938	70	545	38.7	21,091	16	374	56							1	8	350	2,800	3	266	800					11,913	26															
3487	5. 879	3028	15.7	47,539	13	6,180	06	459	37.3	17,120	16	739	20							1	8	350	2,800	2	250	500					12,219	27															
3161	7. 520	2156	15.	32,340	13	4,204	20	1005	60.	60,300	16	648	00	625	3.3	2,062	3	6,186						1	300	300	215	75	161	25	20,499	45															
2840	8.1601	2678	17.5	46,865	13	6,092	45	163	97.	15,811	16	804	09											2	300	600						9,696	54														
2130	10. 211	502	15.	7,530	13	978	90	1463	32.	46,816	16	490	56				165	3,937	12												12,406	58															
1400	10.1611	383	17.9	6,855	13	891	15	1917	32.	32,544	16	207	04																			6,098	19														
3559	12.1650	2454	16.3	40,000	13	5,200	00	920	19.5	17,940	16	870	40				185	4,089	60	1	8	350	2,800	2	300	600					15,560	00															
1830	13.1720	1270	9.8	12,446	13	1,617	93	560	53.3	29,848	16	775	68	306	3.3	1,009	3	3,027	150					3	250	750	701	75	525	75	14,346	41															
2594	15. 794	1343	10.4	14,967	13	1,815	71	1251	35.	43,785	16	7005	60	1251	3.3	4,128	3	12,384	145					6	450	2,700	753	75	564	75	30,924	06															
1863	16. 897	747	32.7	24,426	16	3,908	16	1116	27.7	30,913	16	4,946	08	1125	3.3	3,712	3	11,136														20,251	24														
688	16.1585	199	14.2	2,825	13	307	25	439	83.	36,437	16	5,289	92	439	4.7	2,063	3	6,189	50													15,114	17														
						\$39,665	44							\$65,127	95																			\$43,030		\$20,858	72			\$8,400		\$7,050		\$2,136	00	\$186,318	09





9  
**H. R.**

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**REPORT**  
OF THE  
**AUDITOR OF STATE.**

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DECEMBER 16, 1835.

Read and referred to the Committee on Ways and Means, and 500 copies ordered to be printed.

AUDITOR'S OFFICE, }  
Dec. 16, 1835. }

Hon. C. B. Smith,

*Speaker of the House of Representatives:*

SIR—Please lay the enclosed before the House. No. 1. contains a statement of Receipts and Expenditures on account of the State of Indiana, for 1835. No. 2. a table showing the increase of taxable lands and polls, from 1834 to 1835; together with the number of acres that should be taxed, in 1835.

I have the honor to be,

Very respectfully,

Your ob't serv't,

M. MORRIS,

A. P. A.

to the act entitled "An act concerning the Auditor of the State and Treasurer of State," the Auditor submits the following report of Receipts and Expenditures on account of the State of Indiana, from the 30th day of November, 1834, to the 30th day of November, 1835, both inclusive.

## (No. 1.)

### RECEIPTS.

There was remaining in the Treasury on the 30th Nov. 1834, provided all claims audited to that date were paid		\$ 2,195 39
Since that period there has been received at the Treasury on account of revenue paid for 1831	7 10	
On account of collection of revenue for 1832	77 76	
“ “ “ 1833	103 49	
“ “ “ 1834	44,348 78	
		44,537 13
“ sales of Michigan road lands	10,876 86	
From Agent of State for town of Indianapolis	10,111 14	
“ Sale of Seminary lands	4,457 69	
“ Borrowers of Seminary Fund, (refunded)	8,883 37	
“ Interest on Loans of Seminary Fund	2,518 19	
“ Estate without known heirs	34 03	
“ Rents of Saline Lands	234 12	
“ Sales of Saline Lands	4,402 43	
“ Sales of Mortgaged Lands	500 00	
“ Interest of Indianapolis Fund	2,059 69	
“ Loans of Indianapolis Fund (refunded)	16,657 51	
“ Superintendant of State Prison	700 00	
“ Interest on Saline Funds	682 47	
“ Loans refunded of Saline Funds	500 00	
“ Congressional Township	550 00	
“ Monies refunded	10 00	
		63,177 50
Making the amount of receipts, with cash on hand at last report		109,910 02

## EXPENDITURES.

Since the above period, there has been audited for Public Printing, Stationary, and distributing Laws, &c.	5,542 99
For expenditures of the last General Assembly, including pay of Members, Clerks, and Door-keepers	19,191 22
For salaries of Executive officers	1,800 00
“ “ Prosecuting Attorneys	1,144 29
“ “ Supreme and President Judges	7,108 83
“ “ Probate Judges	2,439 00
“ “ Adjutant and Quarter-master Generals	87 10
On account of State College	2,936 08
“ “ State Library	200 00
“ “ State Prison	2,939 76
“ “ Michigan Road	11,279 23
“ “ Seat of Government	312 00
“ “ Specific Appropriations	2,621 05
“ “ Wolf Scalps	603 00
“ “ Loans of Seminary Funds	10,205 00
“ “ Expenditure of Contingent Fund	774 45
“ “ State House	26,131 74
“ “ Loans of Indianapolis Funds	2,908 35
“ “ Loans of Saline Funds	5,457 50
“ “ Expenditures of Saline Funds	1 62
“ “ Conscientious Fines distributed	9 00
“ “ Treasury Notes burnt	27 00

Making the total amount of Expenditures \$103,773 21

From \$109,910 02, (the Receipts,) take \$103,773 21, (the Expenditures) and there remains in the Treasury, on the 30th November, 1835, \$6,136 81.

The amount of Assessments for the present year is \$58,769 00, from which, after deducting delinquencies and expenses of collection, there will, probably, be realized \$50,900.

Respectfully submitted,

MORRIS MORRIS,  
A. P. A.



TABLE SHEWING THE AMOUNT OF TAXABLE LANDS AND POLLS, from 1834 to 1835: Together with  
the number of acres that should be taxed in 1835.

(No. 2.)

No.	Names of Counties.	No. of acres as- sessed in 1834.	No. of acres as- sessed in 1835.	No. of acres that should be taxed in 1835.	No. of polls in 1834.	No. of polls in 1835.	Amount of as- sessments in 1834.	Amount of as- sessments in 1835.
1	Allen	22,995	22,385	22,410	647	815	339	458
2	Bartholomew	73,588	71,033	82,146	1,263	1,346	934	942
3	Boone	22,990	31,354	31,300	544	729	226	360
4	Clarke	185,246	183,648	185,750	1,856	1,882	1,619	1,617
5	Clay	7,181	10,837	10,667	453	516	217	267
6	Crawford	28,355	28,816	32,041	506	494	319	314
7	Carroll	30,932	39,834	41,758	643	311	465	606
8	Cass	15,005	12,125	25,590	521	630	310	373
9	Clinton	27,636	51,530	47,990	612	769	359	662
10	Dearborn	180,660	178,729	185,251	2,506	2,521	1,772	1,765
11	Decatur	86,827	86,384	91,313	1,311	1,449	1,016	1,076
12	Davies	64,176		65,967	837		670	343
13	Dubois	22,439		18,112	375	351	266	
14	Delaware	12,082	13,633	17,656	608	674	307	343
15	Elkhart		5,184	7,310	520	839	195	352
16	Fayette	111,776	122,675	118,300	1,555	1,559	1,270	1,329
17	Floyd	64,358	64,897	64,998	1,833	1,296	761	809
18	Franklin	69,421	131,506	133,539	1,800	1,794	1,435	1,415
19	Fountain	112,835	121,543	129,614	1,613	1,334	1,372	1,205
20	Gibson	83,526	86,408	91,908	1,122	1,138	898	919
21	Greene	38,565	42,691	44,109	784	806	493	536
22	Grant	5,250	9,270	7,217	222	304	124	185

23	Hamilton	32,012	34,059	32,233	661	841	462	553
24	Huntington		1,354	400	120	159	45	90
25	Harrison	172,454	172,836	190,670	1,713	1,604	1,389	1,349
26	Hendricks	50,170	54,684	63,157	1,272	1,429	778	907
27	Henry	77,852	98,467	102,928	1,659	1,827	1,094	1,278
28	Hancock	17,110	32,157	35,431	615	684	350	467
29	Jackson	77,587	80,645	82,591	1,036	1,144	818	874
30	Jefferson	138,884	141,409	151,256	2,001	2,222	1,448	1,552
31	Jennings	55,993	57,210	59,660	833	877	646	663
32	Johnson	63,349	74,011	76,282	1,996	1,236	806	925
33	Knox	147,993	140,557	154,522	1,253	1,275	1,148	1,120
34	Lawrence	123,247	130,339	128,441	1,507	1,506	1,177	1,225
35	La Grange				287	335	108	125
36	Laporte		64,147	70,362	602	1,115	226	863
37	Madison	20,898	26,692	27,180	770	846	421	487
38	Marion	132,315	147,336	151,950	1,906	2,220	1,496	1,722
39	Martin	20,071	19,604	18,979	304	359	251	262
40	Montgomery	128,103	163,879	168,572	1,814	2,005	1,497	1,815
41	Morgan	58,171	59,692	69,471	1,278	1,281	835	855
42	Monroe	74,137	71,875	79,456	1,309	1,270	871	843
43	Miami		9,262	5,651		323		195
44	Orange	86,787	87,862	98,187	1,156	1,161	841	841
45	Owen	51,907	53,444	54,246	826	877	570	589
46	Parke	108,007	119,113	128,647	1,648	1,668	1,320	1,340
47	Perry	28,588	28,228	31,200	621	558	411	386
48	Pike	27,870	30,928	31,200	500	538	354	391
49	Posey	87,864	92,736	102,546	1,141	1,214	882	1,005
50	Putnam	89,852	107,890	114,631	1,755	2,005	1,195	1,416
51	Randolph	51,668	56,227	60,110	983	951	633	643

52	Ripley	81,567	84,663	86,659	991	1,129	732	847
53	Rush	170,025	181,004	183,710	2,222	2,347	1,865	1,996
54	Scott	50,974	50,995	56,322	612	601	516	514
55	Shelby	90,408	109,666	109,923	1,570	1,723	1,180	1,301
56	St. Joseph	16,152	38,347	45,291	529	813	346	566
57	Spencer	44,538	42,204	447,140	598	621	466	514
58	Sullivan	65,787	70,358	70,455	1,025	994	761	769
59	Switzerland	105,167	123,357	123,556	1,329	1,270	1,073	1,217
60	Tippecanoe	97,165	140,325	142,465	1,750	1,725	1,308	1,550
61	Union	98,606	98,340	99,917	1,279	1,263	1,023	1,029
62	Vanderburgh	34,709	35,933	36,120	611	641	435	457
63	Vermillion	55,989	63,913	64,221	1,185	1,298	777	869
64	Vigo	94,108	99,274	99,923	1,404	1,413	1,154	1,187
65	Warrick	30,223	31,167	31,695	661	699	435	456
66	Washington	170,836	167,977	178,266	1,971	2,042	1,542	1,572
67	Wayne	224,112	230,836	235,081	3,274	3,386	2,326	2,440
68	Warren	29,541	53,681	57,146	781	840	495	672
69	White		2,440		139	168	52	77
70	Wabash		3,130			167		79
		4,650,749	5,210,735	5,912,810	74,358	77,041	53,981	58,769

From the foregoing table it will appear, 1st. That the increase of taxable lands from 1834 to 1835, is 559,986 acres. 2d. That the number of acres assessed for 1835, is 5,210,735. 3d. That the number of acres that should have been assessed in the different counties, (exclusive of school sections which have been sold to individuals,) as appears by the Tract Books of the Auditor's office, is 5,912,810. From which deduct the assessments of 1835, and there are 702,095 acres in the State not taxed for 1835. 4th. That the number of polls assessed in 1834, is 74,358. 5th. That the number assessed in 1835, is 77,041. Shewing an increase for the past year of 2,683 polls. 6th. That the aggregate amount of assessments for 1834, is \$53,981: and 7th, That the aggregate amount of assessments for 1835, is \$58,769. Shewing the increase in the assessments to be \$4,788.

By a comparison of the assessments for 1834 and 1835, it will be seen that in many counties less land was taxed for the year 1835 than for that of 1834. The business of assessing, during the last season has evidently, in many counties, been negligently performed, owing, perhaps, to a practice that prevails in too many of the county boards, of putting it out to the lowest bidder. The collections for this year, and indeed for several years past, have been faithfully attended to; but in consequence of the small per centage allowed for collecting, it scarcely ever happens that the collector of one year is willing to undertake it a second year.

Respectfully submitted,

M. MORRIS,  
A. P. A.





10  
**H. R.**

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**REPORT**

OF THE

**CANAL FUND COMMISSIONERS.**

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**DECEMBER 17, 1835.**

Read, laid on the table, and 1200 copies ordered to be printed.

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OFFICE OF THE COMMISSIONERS OF THE CANAL FUND, }  
Dec. 16, 1835. }

*Hon. the Speaker of House of Representatives:*

Please lay the enclosed report before the body over which you  
preside, and oblige,

Yours, respectfully,

**NICHOLAS M'CARTY,  
JER. SULLIVAN,  
SAM'L HANNA.**

*To the General Assembly of the State of Indiana:*

The Commissioners of the Canal Fund in submitting a report to the General Assembly, as required by law, will premise, that the Canal Commissioners have not yet laid before the Fund Commissioners their accounts and vouchers for examination and settlement. The reasons for this delay will be best explained by the Canal Commissioners themselves in their report to the General Assembly. We therefore must defer to a future period in the session our report shewing the present state of the Canal Fund.

During the present year we have negotiated loans for the prosecution of the Wabash and Erie Canal to the amount of six hundred and five thousand two hundred and fifty seven dollars and forty-two cents, for which bonds of the state of Indiana, bearing an interest of five per cent. per annum payable semi-annually on the first days of January and July, have been sold as follows, viz:

On the 27th day of February last, by virtue of the act of January 9th, 1832, bonds for the sum of \$100,000, bearing interest as aforesaid, from the first day of January, 1835, were sold to Prime, Ward, & King of New-York at a premium of \$2 05.100 per cent.

On the same day, by virtue of the act of February 1st, 1834, bonds for the sum of \$200,000, bearing interest as aforesaid, from the first day of January, 1835, were also sold to Prime, Ward, and King of New-York, at the same premium.

On the 17th of April last, by virtue of the same act, bonds for the sum of \$65,257 42.100 with interest from the first day of July, 1835, were sold to the Secretary of War at a premium of 7 per cent., the principal and interest of which are payable at the City of Washington.

On the 3d of August last, by virtue of the same act, bonds for the sum of \$131,742 58.100, bearing like interest from the first day of July, 1835, were sold to J. I. Cohen, jr. and Brothers of Baltimore, at a premium of five per cent.

On the same day, under the act of February 6th, 1835, bonds for the sum of \$65,257 42.100, on interest from the first day of July, 1835, were sold to the said J. I. Cohen, jr. and Brothers, at a like premium of five per cent.

And on the 28th day of August last, by virtue of the same act, bonds for the sum of \$40,000, on interest from the first day of July, 1835, were sold to Prime, Ward, & King of New-York, at a like premium of five per cent.

All the above bonds, except those sold to the Secretary of War, are payable at the Merchants' Bank of the City of New-York.

On the above sum of \$40,000, the purchasers were to pay the premium on the 16th day of September following, and the principal at any time within four months thereafter, with all interest that might have accrued on the bonds. And in all cases where the bonds bore interest previous to their delivery, the purchasers were required to pay a sum equal to the amount of the interest that had accrued upon them.

We take the liberty of suggesting to the General Assembly that the

loans hereafter authorized, be made redeemable at a definite period, say twenty years. Bonds having twenty years to run will command a premium almost as high as those having a longer time to run. If at the expiration of twenty years the state should be under the necessity of again borrowing, the probability is, that her credit and resources will be better than they are now, and perhaps a higher premium be had for the bonds of the state. Propositions are always made with reference to the shortest time the bonds have to run, hence, fixing an ulterior period is injurious rather than advantageous to the State.

All of which is respectfully submitted.

NICHOLAS M'CARTY,  
JER. SULLIVAN,  
SAM'L HANNA.

INDIANAPOLIS, Dec. 16, 1835.





11  
H. R.

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**REPORT**

or

**THE ENGINEER,**

IN RELATION TO

**THE SEVERAL SURVEYS MADE DURING THE PAST SEASON**

---

DECEMBER 18, 1835.

Read, laid on table, and 1000 copies ordered to be printed.

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INDIANAPOLIS, Dec. 17, 1835.

Sir—

I have the honor herewith to transmit a report upon the several surveys made during the past season under my direction, with a request that they may be laid before the Legislature.

I have the honor to be, Sir,

very respectfully your ob't serv't,

HOWARD STANSBURY,

*U. S. Assist. Civ. Engineer.*

Hon. CALEB B. SMITH,

*Speaker of the House of Representatives:*

INDIANAPOLIS, Dec. 17, 1835.

In accordance with instructions from Lieut. Col. John J. Abert of the Corps of Topographical Engineers, and Chief of the Topographical Bureau at Washington, dated April 10th 1835, directing me to take charge of the several surveys provided for by an act of the last session of the Legislature of the State of Indiana for the superintendence of which, application had been made for an Engineer to be detailed from the United States service, I have the honor to submit the following report of the examinations made under my direction.

My instructions from the War Department, directed me to report to his Excellency the Governor, from whom I received a letter, dated April the 24th, a copy of which is herewith annexed.

The surveys ordered by the law, consist of six routes, viz:

1. A route for a rail road or turnpike road from Madison *via* Indianapolis, Danville and Crawfordsville, to Lafayette.
2. A route for a rail road or turnpike road from Crawfordsville, *via* Greencastle, Bloomington, Bedford and Salem, to New Albany.
3. A route for a rail road from Evansville *via* Princeton to Vincennes.
4. A route for a rail road from Vincennes to Terre-Haute.
5. A route for a McAdamized turnpike road from New Albany *via* Greenville, Fredericksburgh, Paoli, Mountpleasant and Washington, to Vincennes.
6. The completion of the surveys and estimates on the Lawrenceburgh and Indianapolis railway.

To these was added, by special direction of His Excellency the Governor, (a copy of which is annexed to this report,) an examination for a turnpike or rail road from Columbus to Jeffersonville, any connection of these points by means of a canal, having been found impracticable.

In preparing for a series of explorations, spreading over so large a portion of the state, and calculated to exert so important an influence upon her future destinies, it became a matter of much solicitude to make such a selection of professional gentleman to aid me in their prosecution, as from their reputation for experience, energy and skill, would secure their completion in time to lay the results before the Legislature at an early day of its present session. It is with no little gratification that I am enabled to say, that the arduous duties which have devolved upon the several parties, have been generally performed in a manner which has realized my expectations, and deserves my approval.

The progress of the surveys was much retarded in the beginning of the season, by heavy and incessant rains and during the latter part of the summer by sickness, and in one instance by the death of one of the assistants, John P. Paul, Esq., who fell a victim to the severe exposure to which he was necessarily subjected. His loss was much regretted by every member of the Brigade, to whom he had endeared himself by his amiable and gentlemanly deportment.

In the prosecution of the examinations, four parties have been constantly engaged during the season, commencing their several duties at

Lawrenceburgh, Madison, New Albany, and Evansville. A copy of the instructions to each officer in charge, is herewith annexed.

A fifth party was subsequently formed to make the examination from Columbus to Jeffersonville.

Upon the termination of the surveys of the Albany and Crawfordsville, and of the Vincennes and Terre-Haute routes, the party engaged upon the former was placed upon the eastern end of the New Albany and Vincennes road, whilst that engaged upon the latter, commenced a line from the western end of the same road, with instructions to continue their examinations until they should meet. The late period at which this survey was commenced, together with the severe indisposition of the officer in charge of the Eastern party, and the death of Mr. Paul, have rendered the examinations upon this route less minute than could have been desired. Enough however has been done to enable an estimate of its probable cost to be made, which it is confidently believed will be found to approach as near to the truth as could be reasonably expected.

A table is in preparation and will be completed in a short time, the result of the various levels which have been run in the State, shewing the elevations of the most important streams, summits of ridges, and other remarkable features of the country with reference to high water mark of the Ohio at Lawrenceburgh, Madison, Jeffersonville, New Albany, and Evansville, as also with regard to Lake Erie, Lake Michigan and tide water of the Hudson river.

The object of the collection of these facts and compiling them into a permanent record, is not only to afford to the glance of the Engineer a volume of information which will be of material service in enabling him to judge of the comparative merits of routes which may in future be projected, and to determine in some general degree, upon their feasibility, previous to a more minute examination of the country with instruments. But to give to geological investigations such a comparative view of the elevation of different points as will greatly facilitate the progress of that science and the early developement of the mineral resources of the State.

The records in the topographical bureau, of the surveys made by the General Government with a view to the connection of Lake Michigan and Lake Erie with the Wabash river, and the extensive examinations the past season for roads and canals, together with the geographical accuracy secured by the sectional surveys of the public lands, offer peculiar facilities for laying the foundation of a mass of invaluable information which may become more and more useful by future additions.

I am indebted to J. L. Williams, Esq., Principal Engineer of the State, and thankfully acknowledge the obligation, for the frank and ardent manner in which he has co-operated with me, and for the free communication of very important information, the results of his surveys for canals, without which the table would have been comparatively incomplete.

In submitting the reports of the several gentlemen in charge of the



examinations, I deem it proper to say, that the estimates have been made out under my immediate supervision, and may, in my opinion, be fully relied on as being amply sufficient to cover the cost of the different works.

It has been a matter of solicitude with me, to lay before the Legislature, such information as would enable them to embark in a system of internal improvements, should they determine to do so, with a full knowledge of the expense which will be incurred in its prosecution, and to avoid holding forth inducements to any enterprise, by the presentation of low estimates, the inadequacy of which can only be detected when it is too late to remedy the evil.

For the purpose of assisting in the formation of a just judgment as to the comparative cost of rail roads in different parts of the State, the cross sections of all have been made to conform to one uniform standard. The plan of superstructure is in every case the same, so that the variation in cost should depend alone upon the natural difficulties encountered upon each particular route.

In all cases in which the act of the Legislature directed the examinations to be made with a view to the construction of either a rail road or turnpike road, the former mode of improvement has with one exception been found to be entirely practicable. Upon the route from New Albany to Crawfordsville, however, it was ascertained that the cost of graduation alone for a rail road would amount to a sum of such magnitude as to preclude all prospect of its construction. The examination for this object was therefore abandoned, and the attention of the party directed exclusively to the selection of a route for a turnpike road. The extended nature of our operations did not allow a separate survey to be made with a view to a minute analysis of the cost of both modes of improvement, as in many instances the roads would occupy very different ground, but enough has been done to enable me to present an estimate of their comparative expense which, will approximate very near the truth.

#### MADISON, INDIANAPOLIS, AND LAFAYETTE RAIL ROAD.

The charge of the survey of this road was entrusted to Mr. Edwin Schenck, aided by Mr. George O. Drescoll and S. T. Gillet; and subsequently by Mr. D. McDougal.

Directions were given to the party after reaching Franklin, to make an examination of the country on the west side of the valley of Driftwood, diverging from the main line in the neighborhood of Vernon, to ascertain whether the expense of crossing the numerous streams encountered on the eastern route could not be avoided, and a shorter and cheaper line obtained between those points.

From the report upon the survey it will be perceived that by the route on the west side of the river, the length of the road would be increased three miles and the expense enhanced \$8,693 67. As in addition to this increase of cost, the route would avoid the town of Columbus entirely, its adoption is not recommended.

Directions were likewise given, that after complying with the requi-

sitions of the law which directed the examination from Indianapolis to Lafayette to be made *via* Danville and Crawfordsville, that a line should be run direct to Indianapolis for the purpose of instituting a comparison as to the relative length and expense of the two routes. This was accordingly done, and an estimate has been made of the cost of each.

The distance to Lafayette by Danville and Crawfordsville was found to be 74½ miles, whilst by the direct route it is only 60½ miles. The whole cost of the road by the former, amounts to \$1,257,213 34, whilst by the direct route it is but \$572,313 72, shewing a difference

In actual length, of	-	-	13½ miles
In equated length of	-	-	29.93 "
And in cost of construction of	-	-	\$684,899 62

in favor of the direct route.

This difference is rather greater than was anticipated, and is accounted for in the report upon the survey.

The whole estimated cost of the road with single track from Madison to Indianapolis (including the inclined plane) amounts to \$1,094,484 11, giving an average of \$12,800 09 per mile.

The whole cost from Madison to Lafayette *via* Danville and Crawfordsville, amounts to \$2,351,697 45, giving an average of \$14,721 11 per mile.

The whole cost from Madison to Lafayette by the direct route, 146 miles, amounts to \$1,666,797 83 giving an average of \$11,416 42 per mile.

It may be observed as a general remark, that in the estimates which have been made of the cost of the several railways, a graduation has been contemplated, with a view to the ultimate construction of two tracks, although the immediate cost of one track has alone been given.

This does not by any means give a fair proportionate estimate of the cost of a road with a double set of tracks, for the additional track according to the estimate, will only cost \$3,742 63 which would give as the whole cost of this road with a double track, the sum of \$15,159 05 per mile.

But as the road when completed with one track could be used in the transportation of all the necessary materials, this amount would be considerably reduced, so that the road with a double set of tracks upon the plan proposed, would cost about \$14,500 per mile.

For farther details, I refer to the very satisfactory report of Mr. Schenck, who in the performance of his duties, both in the office and in the field, has evinced judgment, skill, perseverance, and indefatigable industry.

As was before remarked, an examination for a rail road does not necessarily furnish all the data that would be required to enable a minute estimate to be made of the cost of a turnpike road; for in many instances the trace of the one, would properly occupy ground which for the other would be inexpedient or impracticable. By the aid, however of other data in addition to those furnished by the survey of this rail road, we are enabled to arrive at the comparative expense of con-

structing a rail road or a turnpike road from Madison to Lafayette.

In the following analysis of the cost of the turnpike, the estimated cost of a similar work between New Albany and Crawfordsville is assumed as a maximum basis.

The average cost of graduation, masonry, and bridging upon that road, amounts to \$3,978 36 per mile.

The quantity of masonry that will be necessary upon the turnpike from Madison will not differ materially from that required for a rail road from that point, as the same number of streams will necessarily be crossed in the one case as in the other. Therefore the deducting from the average cost of graduation upon the Albany turnpike, the cost of masonry and bridging required upon that line, and substituting therefor the cost of the same item upon the Madison rail road, will shew with sufficient approximation the cost of graduation and masonry necessary in the construction of the turnpike road.

The average cost of graduation upon the Albany and Crawfordsville road, deducting masonry and bridging, amounts to \$2,223 72 per mile.

This for 42.54 miles (the distance from Madison to Columbus) will be	-	-	-	-	-	\$94,597 05
Add masonry and bridges as per survey for rail road						87,021 00

Total cost of road from Madison to Columbus	-	\$181,618 05
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Giving an average cost of \$4,269 34 per mile.

From Columbus to Indianapolis the graduation will be much more favorable, subjecting this portion of the route to the same analysis, gives

Total cost from Columbus to Indianapolis	-	\$122,339 25
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Average cost per mile	-	-	-	-	\$2,847 08
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Making the whole cost from Madison to Indianapolis amount to	-	-	-	-	\$303,957 30
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or an average of \$3,554 64 per mile.

From Indianapolis to Lafayette *via* Danville and Crawfordsville, the whole cost will be \$290,989 21. The average cost \$3,919 04 per mile.

From Indianapolis to Lafayette by the direct route, the whole cost will be \$178,390 06.—The average cost \$2,948 59 per mile. Giving as the cost of a turnpike road from Madison to Lafayette by Danville and Crawfordsville, 159.76 miles, the gross sum of \$594,946 51—averaging per mile \$3,724 00; and by the direct route the gross sum of \$482,347 36—averaging per mile \$3,303 74.

#### EVANSVILLE AND VINCENNES, AND VINCENNES AND TERRE-HAUTE RAIL ROAD.

The charge of this examination was committed to Mr. J. W. Collins. The duties of the field were performed by Messrs. Randolph, Coyle, and R. H. Fauntleroy. The cost of graduation upon this route will be unusually moderate.

The cost of road bed from Evansville to Vincennes, a distance of 61.15 miles	-	-	-	-	\$255,679 43
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Average cost of graduation per mile	-	-	-	4,181	18
The whole cost of the road, single track	-	-	-	537,311	77
Average cost per mile	-	-	-	8,786	77
Total cost of road bed from Vincennes to Terre-Haute, a distance of 57.9 miles	-	-	-	205,894	71
Average cost of graduation per mile	-	-	-	3,875	42
Total cost of road from Vincennes to Terre-Haute, single track	-	-	-	469,393	05
Average cost per mile	-	-	-	8,099	63
Total cost of road from Evansville to Terre-Haute, sin- gle track, but graduated for double track	-	-	-	1,006,704	83
Average cost per mile	-	-	-	3,452	27
Should the additional track be laid down, the total cost of the road will be	-	-	-	1,452,412	59
Average cost per mile	-	-	-	12,194	90

#### LAWRENCEBURGH AND INDIANAPOLIS RAIL ROAD.

By order of His Excellency the Governor, an examination was made of the whole of this route, commencing at Lawrenceburgh, instead of simply completing the survey from Greensburgh, to which point it had progressed, when its further prosecution was prevented by the death of the Engineer engaged upon it.

The survey was conducted by Julius W. Adams, assisted by Messrs. W. W. Törbert and Charles I. McNeill.

It will be perceived from the report of this gentleman, that no inclined plane with stationary power will be necessary to attain the level of the high table land of the interior, but that in one instance a grade of sixty feet to the mile for  $2\frac{1}{2}$  miles is recommended as the most economical mode of overcoming the rise of a particular portion of Tanner's Creek. It is to be hoped that farther examinations will enable this grade either to be reduced or distributed along the ascent into shorter stages so as not to exceed the elastic force of the motive power employed upon the road.

The distance from Indianapolis to Lawrenceburge is 94 miles.

The total cost of graduation amounts to	-	-	-	\$609,928	76
The total cost of road graduated for double track,	-	-	-	1,063,855	15
Average cost per mile	-	-	-	11,317	60
Should the double track be added the cost will be	-	-	-	1,415,662	37
Average cost per mile	-	-	-	15,060	23

#### COLUMBUS AND JEFFERSONVILLE RAIL ROAD.

The examination of this route for a canal having resulted in the ascertainment of its inexpediency, it was ordered by His Excellency the Governor, to be surveyed with a view to the construction of a Railway or turnpike road.



The charge of the party was given to Mr. Randolph Coyle who was relieved from duty on the Vincennes road for the purpose. He was aided in the performance of the duties of the field, by Mr. Charles J. McNeill and Mr. S. T. Gillet.

The examination has satisfactorily demonstrated the entire practicability of constructing a Railway over the ground explored, at a moderate expense.

The distance from Columbus was found to be 73.15 miles.

The total cost of the road bed graduated for a double

track	-	-	-	-	-	-	-	\$377,129 41
Average cost per mile	-	-	-	-	-	-	-	55,15 46
Total cost of Road (single track)	-	-	-	-	-	-	-	721,394 80
Average cost per mile (single track)	-	-	-	-	-	-	-	9,861 65
Or, for a double track total cost	-	-	-	-	-	-	-	995,173 85
Average cost per mile	-	-	-	-	-	-	-	13,604 38

The same mode has been adopted to arrive at the cost of a turnpike road over this route, as was resorted to in the case of the Madison and Lafayette road, although the proportionate amount of graduation per mile will be much less than upon the New Albany and Crawfordsville road, which is in both instances assumed as the basis of calculation. The following are the results.

Total cost of Turnpike road from Indianapolis to

Columbus	-	-	-	-	-	-	-	\$122,339 35
Average cost per mile	-	-	-	-	-	-	-	2,847 08
Total cost from Columbus to Jeffersonville	-	-	-	-	-	-	-	290,438 08
Average cost per mile	-	-	-	-	-	-	-	3,973 16
Total cost from Indianapolis to Jeffersonville	-	-	-	-	-	-	-	412,777 33
Average cost per mile	-	-	-	-	-	-	-	3,554 74

Should the construction of a Railway between these points be deemed expedient, the following will be the cost.

Total cost of Railway from Indianapolis to Columbus

(single track)	-	-	-	-	-	-	-	\$365,145 89
Total cost from Columbus to Jeffersonville	-	-	-	-	-	-	-	721,394 80
Total cost from Indianapolis to Jeffersonville	-	-	-	-	-	-	-	\$1,086,540 69
Average cost per mile	-	-	-	-	-	-	-	9,357 05

With double track the cost would be	-	-	-	-	-	-	-	\$1,521,134 88
Average cost per mile	-	-	-	-	-	-	-	13,099 68

The survey for this road was not commenced until the second week in September. For the efficient and energetic manner in which it was conducted, I am indebted to Mr. Coyle, and to the able report of that officer I refer for the details of the route.

#### TURNPIKE ROAD FROM NEW ALBANY TO CRAWFORDSVILLE.

The survey of this route was made by Mr. Edward Watts assisted by Messrs. John P. Paul and Fitzhugh Coyle.

As a distinction between a turnpike and a Macadamized turnpike road seemed to be recognized and drawn by the law, the estimates do not embrace the cost of covering the road with stone, but contemplate only an earth road well graded and drained. The principles which should govern the constructions of such a work are contained in the instructions to Mr. Watts, and are with slight variations the same as those furnished by the Engineer Department of the United States to its officers.

The whole length of this road passing through the towns of Greenville, Salem, Bedford, Bloomington, and Greencastle, is 158 miles.

The total cost of graduation including two bridges over

the White rivers amounts to	-	-	-	-	\$628,581 94
Average cost per mile	-	-	-	-	3,978 36

#### MACADAMIZED TURNPIKE ROAD FROM VINCENNES TO NEW ALBANY.

The survey of the western section of this road was made by the party under Mr. Collins, and that of the eastern section by the party under Mr. Watts, after completing the respective surveys in which they had been engaged.

The distance from Vincennes to New Albany is 104.8 miles.

The total estimated cost of graduating the road and prepa-

ring it for the reception of the metal covering, amounts to	\$450,697 23
Average cost of graduation per mile	- - - 4,300 54
Total cost of covering the road with stone	- - - 1,140,050 07
Average cost per mile	- - - 10,878 34
Total cost of the road when completed	- - - 1,590,747 30
Average cost per mile	- - - 15,178 88

From the above statement it will at once be observed that the expense of covering the road with stone bears an uncommonly large proportion to the cost of graduation. Of this amount \$450,000 or nearly one half, will be required between Vincennes and Washington, a distance of but 20.41 miles. On this portion of the route no stone suitable for Macadamizing can be obtained. The nearest point at which it occurs in sufficient quantity is at such a distance that the cost of its transportation is the principal item of expense. The cost of the stone alone on this division is equal to the whole cost of graduation, including bridging and masonry throughout the line.

The report upon the survey contains an analysis of the data upon which the estimate is based, that will account for this unusual expense. By reference to that report it will be perceived that upon other portions of the road, stone can be procured within a comparatively reasonable distance. In consideration of this variation in expense, it is recommended that stone should be used upon those portions only where it can be conveniently furnished, and that the remainder of the road should be well graded and drained in strict conformity with the principles laid down in my instructions to the gentlemen in charge of the surveys, which are those approved in the service of the United States. As has been the case upon the National road, the graduation may lead

to the discovery of stone in the vicinity of the line, the existence of which is at present unknown, and obviate the necessity of its transportation from a distance.

Five expensive bridges will be necessary to pass the projected works over the White rivers. Two on the road from New Albany to Crawfordsville, two on the road from Vincennes to New Albany, and one on the rail road from Evansville to Vincennes.

A plan for the superstructure of these bridges is herewith transmitted, and is the same as that adopted for the passage of the National road over the Wabash river. For this I am indebted to Lieut. Sanders of the United States Corps of Engineers. The principles are such as I approve, and the estimates contemplate a similar construction.

The following summary will exhibit at one view the whole estimated cost of all the works for which surveys have been made.

### S U M M A R Y.

DESIGNATION OF ROUTE.	Length.	Average Cost.	Total Cost.
Madison, Indianapolis, and Lafayette road - - - -	146	\$11,416 42	1,666,797 83
Evansville and Vincennes road -	61.15	8,786 77	537,311 77
Vincennes & Terre-Haute road	57.9	8,099 63	469,393 05
Lawrenceburgh & Indianapolis road - - - -	94.	11,317 60	1,063,855 15
Columbus and Jeffersonville road	73.15	9,861 65	721,394 80
New Albany and Crawfordsville turnpike - - - -	158	3,978 36	628,581 94
Vincennes & New Albany road (graduation) - - - -	104.8	4,300 54	450,697 23
695 miles . . . .			\$5,538 031 77

I have purposely refrained from entering upon the discussion of the advantages, independent or comparative, of any of the projected improvements, or hazarding the expression of any opinion which might inadvertently do injustice to their several claims to the patronage of the state, but have confined myself strictly to the impartial exposition of the facts elicited by the operations of the past season, leaving to the wisdom of the Legislature, in possession of all necessary information, to act advisedly in deciding upon the relative merits of each.

It is respectfully recommended that it should hereafter be made a conditional provision in the charters granted for rail road improvements, that the viaducts necessary to pass the principal streams should be constructed of a sufficient additional width to admit the free passage of ordinary road wagons. The extra expense incurred for this



purpose would not be very great, and the arrangement would be found to be of material service in facilitating the travel of the country.

It may be a question whether it would not be good policy to make provision by direct appropriation or otherwise for the adoption of this plan upon roads, the charters for which have already been granted.

In conclusion, I respectfully acknowledge the unvarying kindness and courtesy that has been extended to me by His Excellency the Governor, under whose orders I have acted.

Feeling deeply interested in the prosecution of the surveys to successful results, his counsel and countenance have never been wanting to advise and encourage, and have materially aided me in the performance of my duties.

Respectfully submitted,  
**HOWARD STANSBURY,**  
 U. S. Ass't. Civ. Eng'r.

TOP'L. BUREAU, April 10, 1835.

Sir—

You will repair to Indianapolis, State of Indiana, and reporting yourself to His Excellency the Governor of that State, you will inform him that you are ready to superintend the several surveys for which that state has applied to have an engineer detailed from the U. S. service.

You will take the orders of His Excellency on these subjects, communicate freely with him, lay before him estimates for the requisite funds, and furnish him with the returns of your work.

This Bureau will expect copies of the drawings and reports.

I am respectfully sir,

your obed't. serv't,

**J. J. ABERT,**  
 Lieut. Col. T. E.

**HOWARD STANSBURY, Esq.,**  
 U. S. Ass't. Civ. Eng'r.  
*Washington City.*

EXECUTIVE DEPARTMENT, }  
*Indianapolis, 24th April, 1835.* }

Sir—

At the late session of the Legislature of the state, the adoption of a connected and general plan of Improvement affording commercial facilities to every section, was the measure occupying most of the deliberations of the body, but the absence of such facts and information as seemed indispensable, prevented the adoption of any. To enable the legislature at its next session, to act advisedly in the premises, and to determine upon the relative claims of Canals and Rail-ways, on the



patronage of the State or whether it will be best to select the one or the two modes of conveyance combined, the surveys and estimates provided for by the law, of which you have a copy, were ordered.

The law, as you will discover, would seem to leave it for the Governor to determine whether the surveys upon the Madison and Lafayette, and New Albany and Crawfordsville lines should be for a *Rail-way* or a Turnpike; it is believed, however, that it was the wish and intention of the legislature to include both. There are no means by which to ascertain, whether the legislature designed the surveys and estimates should be for double or single tracks, the law being silent on the subject, but as a single track would not be of great value to the public, it is thought advisable to make them with a view to the construction of a double track, but if found that it will not require much additional time and expense, estimates for each will be preferred.

The examinations and surveys upon the Lawrenceburgh line, as you will perceive, are to be made "under the direction of a board of directors," organized under the charter granted the Rail Road Company on that line.

Upon the lines from Evansville to Vincennes and to Terre-Haute and from Lawrenceburgh to Indianapolis, the surveys will not include Turnpikes.

In the construction of her public works, it has been the policy of the State to embark in none of a temporary character, therefore the estimates should embrace materials and structures of a durable and permanent kind only.

Not intending to engage in any work of doubtful expediency or utility and desirous of avoiding the evil consequences of low estimates upon the proposed lines of Rail-ways, Canals, and Turnpikes, the legislature incorporated that provision of the 20th section, which directs the verification of the reports to be made by the affidavits of the principal officers in charge of the several lines.

Taking the law, with this letter of instruction for your government, you will proceed to organize four parties, with as little delay as possible, and place them on the lines commencing at Lawrenceburgh, Madison, New Albany, and Evansville. You will upon your arrival at New Albany confer with John K. Graham Esq. and if instruments can be obtained, and you find that a fifth party be necessary to the completion of the whole work by the time named in the law, (the commencement of the next session of the legislature,) you will direct him under your superintendence to commence the work of the Vincennes Turnpike, authorizing him to procure the necessary out fit.

In the expenditure of public funds hitherto, it has been the object of the State to introduce and establish a strict economy and accountability which should be observed, also in the prosecution of the surveys placed under your superintendence.

The funds necessary for the service, will be paid on your requisition, and this department will hold you accountable for the same, for which purpose it will be necessary for you to make to the Auditor of the State a quarterly report, with vouchers containing a satisfactory reference in

detail to the items of expense pertaining to the accounts of each party of Engineers, beginning with the quarter ending the 31st of May.

When organized you will require each principal Engineer to transmit to the Auditor an inventory of the camp equipage and a roll with the names and per diem or other rate of compensation of each individual of the party, and when the work is completed you will cause a safe conveyance of the tents and other public property to be given for the seat of government.

(Signed.)

N. NOBLE.

COL. HOWARD STANSBURY,

*United States Civil-Engineer.*

MADISON, April 28, 1835.

Sir—

The Legislature of the State of Indiana having at their last session directed "an examination, survey, and estimate to be made" of a route for a rail road or a turnpike, from Madison, by the way of Indianapolis, Danville, and Crawfordsville to Lafayette; you will take charge of the party employed for that purpose. Messrs. George O. Driscoll and S. T. Gillet will be directed to report to you for duty and receive your instructions.

In carrying into effect the intentions of the Legislature, you will commence the survey at the this place and make such exploration of the country as will enable you to report upon the best probable route, and to base an estimate of the probable cost of the construction of the road.

You will keep a journal of the operations of your party, and keep me advised weekly of your proceedings.

In all expenditures necessary for your party, for which the funds will be furnished you, you will consult the most rigid economy, in all cases taking duplicate receipts, the amount of which alone will be passed to your credit.

In the engagement of such hands as may be necessary, it should invariably form a condition of their employment, that they abstain from the use of ardent spirits entirely whilst in your service; a breach of this condition unless under peculiar circumstances should be followed by immediate dismissal.

You will in no case permit any work upon the line to be done upon the Sabbath day.

Respectfully, your ob't serv't,

(Signed.)

HOWARD STANSBURY.

EDWIN SCHENCK Esq. *Civil Engineer.*

Madison, Indiana.

LAWRENCEBURGH, IND., May 4th, 1835.

Sir—

The Legislature of the State of Indiana having, at their last session, directed the Governor to employ some suitable and competent Engineer, whose duty it shall be to proceed under the directions of the Board of Directors to complete the survey and estimates on the Lawrenceburgh and Indianapolis Rail-road, I have been authorized by his Excellency to make the necessary arrangements to carry this law into effect.

In accordance with the authority thus invested in me, you are directed to take charge of the party employed for that purpose—Messrs. W. Torbert and Chas. J. McNeill are ordered to report to you and receive your instructions.

You will commence the survey at this point, and make such examinations as in your judgment, and that of the Board of Directors of the work, may be necessary.

You will confer freely with the Board and receive their directions; should they require the permanent location of any part of the line, you will comply with their wishes.

Your explorations upon the whole length of the proposed route, will be minute, and such as will enable you to present a detailed report upon the best route and the probable cost of construction of the work.

You will keep a daily journal of the operations of your party, and keep me advised of your proceedings by weekly reports directed to me at Indianapolis.

In your expenditures, for which the necessary funds will be furnished you, you will consult the most rigid economy, in all cases taking duplicate receipts, the amount of which alone will be passed to your credit.

In the employment of your hands, it should invariably form a condition of their engagement, that they abstain entirely from the use of ardent spirits whilst in your service; a breach of this condition, unless under peculiar circumstances, should be followed by immediate dismissal.

You will, in no case, permit your camp to be removed, or any work upon the line to be done upon the Sabbath day.

Your estimates should embrace materials and structures of a durable and permanent kind only.

When organized, you will transmit to me, to be laid before the Auditor of State, an inventory of your camp equipage, and a roll with the names and per diem, or other rate of compensation of each individual of the party; and when the work is completed, you will cause a safe conveyance of the tents and other public property to be given to the seat of government.

You will transmit me monthly, an estimate of the funds necessary for the service of the succeeding month; and on the 31st day of May, you will transmit your vouchers for the expenditures of the funds in your hands, together with an abstract embracing the names, amount paid to each, the nature of the expenditure, and the aggregate



sum paid by you, together with an account current shewing the state of the account. Both abstract and account current will be in duplicate.

I am, Sir,

Respectfully,

Your ob'dt serv't,

HOWARD STANSBURY,

*U. S. Ass't. Civ. Engineer.*

JULIUS W. ADAMS,

*Civil Engineer, Lawrenceburgh, Ia.*

NEW ALBANY, May 9th, 1835.

Sir—

The Legislature of the State of Indiana, having at their last session directed an examination to be made of a route for a Rail-road or a Turn-pike from Crawfordsville by the way of Greencastle, Bloomington, Bedford, and Salem to New Albany; together with an estimate of the probable expense of constructing either or both works, you are charged with the execution of the survey.

Messrs. John P. Paul and Fitzhugh Coyle are ordered to report to you and receive your directions.

You will commence your operations at this place, and continue your examinations through the points above mentioned.

Your explorations upon the whole length of the proposed road will be minute, and such as will enable you to present a detailed report upon the best route and the probable cost of constructing the work.

In the construction of her public works, it has been the policy of the State to embark in none of a temporary character, or of doubtful expediency, and to avoid, as far as possible, the evil consequences of low estimates upon any improvements she may be disposed to construct.

Your estimates will contemplate materials and structures of a durable and permanent kind only.

Your examinations for the route of the rail-road will be made with a view to the construction of a double track.

The enclosed instructions will govern you in your explorations of a route for a turnpike road.

You will keep a daily journal of the operations of your party, and advise me of your proceedings by weekly reports directed to me at Indianapolis.

In your expenditures, for which the necessary funds will be furnished you, you will consult the most rigid economy, in all cases taking duplicate receipts, the amount of which alone will be passed to your credit.

You will transmit to me a monthly estimate of the funds necessary for the service of the succeeding month, and on the 31st day of May, you will send in your vouchers for the expenditure of all funds in your hands from the commencement of your operations to that date, with an abstract embracing the names, amount paid to each, the nature of the expenditure, and the aggregate sum, and an account current show-



ing the state of the account. Both abstract and account current will be in duplicate.

When organized, you will transmit to me to be laid before the Auditor of State, an inventory of the camp equipage, and a roll containing the names and per diem, or other rate of compensation of each individual of the party; and when the work is completed, you will cause the tents and other public property to be safely conveyed to the seat of government.

In the employment of your hands, it should invariably form a condition in their engagement, that they abstain entirely from the use of ardent spirits whilst in your service: a breach of this condition should, unless under peculiar circumstances, be followed by immediate dismissal.

You will, in no case, permit your camp to be removed, or any work upon the line to be done upon the Sabbath day.

Should the inequalities of the country prove such as would, in your opinion render the construction of a rail-road impracticable or very expensive, your operations will be directed to the attainment of a route for a hard, compact, travelling way, thirty feet wide, with the upper surface sufficiently elevated to prevent its being affected by any neighboring stagnant water; having in no case, a longitudinal slope of more than three and a half degrees, and no horizontal curvature too abrupt to admit of carriages of every description passing over it with perfect facility.

To accomplish these conditions, the following rules are prescribed for your government, and are founded upon the supposition that *high ridge*, *low bottom*, and *trembling marshy* lands will embrace all the varieties of ground to be met with in the course of your operations.

In the first place, as a general rule, not to be departed from, the ground is to be cleared and well grubbed to a width of forty feet on each side of the line of location or axis of the road, making an opening of eighty feet wide; then if the ground be of a description to require ditches, it is to be well ploughed to insure the removal of all vegetable matter of any magnitude from the space thus cleared.

In case of high ridge land—

The first operations after grubbing, will be, if the ground be level, to dig two parallel ditches, three feet deep, eleven feet wide at top, two feet at bottom, having their outer edges to correspond to the outer limits of the clearing, thus leaving fifty-eight feet in the clear between the ditches, the dirt from the ditches to be thrown up to form the road-way, so as to be one foot two inches above the natural surface of the ground in the middle, and to run off to nothing at the edges of the ditches, agreeably to the sketch No. 1, which equalizes the excavation and embankment.

Should the ground, however, have a gentle declivity from either side of the road, the ditch on the lower side will be suppressed, provided there be no ground in the immediate neighborhood, to cause the water in times of heavy rain to flow back to the road.

Should the level of the ground be such as to cause the water collected in the ditches to remain stagnant, or to pass off only by evaporation, lateral drains will be constructed, at such places as may offer opportunities to draw it off to the neighboring low grounds. In case where the longitudinal declivity of the road is such as to cause rapid currents in the ditches, it will be necessary to provide against their destruction, by lining them with brush, well secured by long and substantial pegs.

When the location runs along the side of a hill, the section of the road will be made to conform to sketch No. 2, equalizing as nearly as possible, the excavation and embankments.

In such cases, particularly where the slopes ab. ab. are of any considerable extent, it will be necessary to protect them against the wash of heavy rains by covering them with brush fastened to its place in the manner described for the protection of the the side drains. The outer edge of the road way should be five inches higher than the next drain on the hill side, which will prevent the water from the road washing away the embankment that sustains the outer half.

The ditch on the hill side receiving the drainage both from the road and the hill, will be provided with culverts as indicated in the sketch, located at such distances as may seem necessary and proper to prevent the accumulation of water in sufficient quantity to injure the road, all this is on the supposition that the soil is in a greater or less degree impervious to water, and of a nature to have its consistency materially affected by it; but should the ground on the contrary, be sufficiently porous to allow of the quick and easy passage of the water in times of heavy rains from the surface by sinking, ditches would be unnecessary. Such would be the case when the location passes over ridge land of a gravelly or sandy texture.

2d. Low bottom lands saturated with water from want of natural drainage.

If practicable, ditches of the same dimensions, and having the same relative positions as before will be constructed, the dirt from which will be thrown in the middle between them to form an embankment, the cross section of which shall conform to that indicated in sketch No. 3.

This embankment or causeway, has its surface in the middle three feet above the natural surface; two feet eight inches above the natural ground at its sides, and is thirty feet wide at top, with side slopes having a base twice the height.

It is the intention that the earth which may be required in addition to that furnished by the ditches to make this embankment, shall be taken from such of the neighboring ground as may furnish it most readily, and at least expense. It may be necessary in some localities, to take all the earth for the causeway from the ditches, in which case it will be proper to increase their width rather than their depth; in other localities it may be impossible to excavate ditches at all in consequence of the too great fluidity of the soil, when resort must be had to the neighboring grounds for requisite embankment. The width of the road-

way should always be at least thirty feet. It may become necessary, however, to increase its height from the natural surface of the ground, above that given in the sketch, the invariable rule being to elevate it at least three feet above the surface of the water, should the ground be covered with the fluid, reserving the same lateral grade as given in the sketch.

### 3d. Trembling Marsh.

Here the first operation will be to construct facines for the purpose of forming a kind of continuous base for the causeway which will be of the same dimensions as that in the case of low bottomed land. These facines should be thirty feet long, from seven to nine inches in diameter, and should contain no sprig or branch of a diameter greater than one inch and a half, the object being to unite pliancy and elasticity with continuity of bearing surface. The facines are to be laid in contact with each other, having their length perpendicular to the axis of the road or line of location, when the ditches of the same dimensions as those already described and similarly situated are to be excavated, the dirt being thrown over the facines as represented in sketch No. 4.

In such soil it may often be impossible to excavate ditches, in which case recourse must be had to the first adjacent ground that will furnish the requisite embankment at least expense.

Respectfully,

HOWARD STANSBURY,

*U. S. Ass't. Civ. Engineer.*

EDWARD WATTS,  
*Civil Engineer.*

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EVANSVILLE, May 15, 1835.

Sir—

The Legislature of the State of Indiana having at their last session directed an examination to be made of a route for a Rail-road from Evansville to Vincennes, via. Princeton, together with an estimate of the probable expense of constructing the same, you are charged with the conduct of the survey. Messrs. Randolph Coyle and R. H. Fauntleroy are ordered to report to you and receive your orders. The compensation allowed to the former will be \$3 50 per diem, and that of the latter of these gentlemen will be \$2 00 per diem.

You will commence your operations at this place, and continue your survey through the point mentioned. Your explorations upon the whole length of the proposed route will be minute, and such as will enable you to present a detailed report upon the best route, and the probable cost of constructing the work.

In the construction of her public works, it has been the policy of the State to embark in none of a temporary character, or of doubtful expediency; and to avoid, as far as possible, the evil consequences of low estimates upon any improvements she may be disposed to make: Your estimates, therefore, will contemplate materials and structures of a durable and permanent kind only.



You will keep a daily journal of your proceedings, and advise me of the progress of your operations by weekly reports directed to me at Indianapolis.

In your expenditures, for which the necessary funds will be furnished you, you will consult the most rigid economy, in all cases taking duplicate receipts, the amount of which alone will be passed to your credit.

You will on the first of every month transmit to me an estimate of the funds necessary for the service of that month, stating specifically the object to which it is to be applied; and on the 30th of June you will send in one set of your vouchers for the expenditure of all funds in your hands from the commencement of your operations to that date, together with an abstract embracing the names, amount paid to each, the nature of the expenditure, and the aggregate sum; and an account current shewing the state of the account. Both abstract and account current will be in duplicate.

When organized, you will transmit to me to be laid before the Auditor of State, an inventory of the camp equipage, and a roll containing the names and per diem, or other rate of compensation of each individual of the party, and when the work is completed, you will cause the tents and other public property in your possession to be safely conveyed to the seat of government.

In the employment of your hands, it should invariably form a condition of their engagement, that they abstain entirely from the use of ardent spirits whilst in your service. A breach of this condition should, unless under peculiar circumstances, be followed by immediate dismissal.

You will, in no case, permit your camp to be removed, or any work upon the line to be done upon the Sabbath day.

After completing the survey to Vincennes, you will make a survey, similar in all respects, to the last mentioned, of a route for a railroad from Vincennes to Terre-Haute, in the prosecution of which, you will consider what has been said above as your instructions and authority.

Having been directed by the U. S. Topographical Bureau, to make such collections of minerals and other rare productions of the country, you will endeavor, as far as possible, to aid me in carrying their wishes into effect. Any specimens which you may be able to procure, you will have carefully packed in a box, and bring them with you to Indianapolis.

I am Sir,

Very respectfully,

Your ob't. servant't,

HOWARD STANSBURY,

U. S. Ass't. Civ. Engineer,

JAMES W. COLLINS,

Civil Engineer, Evansville, Vanderburgh co., Ind.



EXECUTIVE DEPARTMENT, }  
 Indianapolis, August, 1835. }

Sir—

The act of the last session of our Legislature directing the survey of a route for a canal, from the Seat of Government to the Falls of the Ohio, made provision also, for the survey of a rail-way or turnpike, if, after the first examination, a canal should be found inexpedient or impracticable, to which law you are referred.

The Commissioners and Engineer having informed me that a canal is not expedient, you will therefore proceed to the survey of a route for a Rail-road and turnpike, upon the plan of the other surveys, taking my letter of instructions in relation to the surveys, for your government.

I am, Sir,

Respectfully,

(Signed)

N. NOBLE.

Col. H. STANSBURY,

U. S. Civ. Engineer.

INDIANAPOLIS, September 1, 1835.

Sir—

Upon the termination of the survey upon which you are now engaged, you will return with your party to Greenville, and proceed to examine a route for a McAdamized road, to pass through Fredericksburgh, Paoli, Mount Pleasant, and Washington, to Vincennes. A party will be placed upon the western end of the line, who will probably meet you somewhere near Paoli.

In the preparation of your estimates, you will take as your guide, the following principles which obtain in the construction of your work:

The road must be cleared of trees to a width of 40 feet; in the central portion of 30 feet in width; the stumps must be grubbed with care, and the bed of the road levelled; the hills cut down; the earth, stones, and stumps removed; the hollows, and valleys, and abutments of all the bridges and culverts filled so that the inclination of no width of 30 feet shall exceed an angle of  $3\frac{1}{2}$  degrees with the horizon. When the road is to be carried over hollows, the sides are to slope at an angle not exceeding 30 degrees with the horizon, and the complete width of 30 feet must be maintained at the surface, a proper allowance being also made for the settling of made earth, and no stumps, logs, or wood of any kind to be permitted in the filling. In all situations, on sides of hill or otherwise, where it may be necessary to fill, but when the nature of the ground will not admit, in your opinion, of filling with such slope, as above mentioned side walls should be estimated, for sustaining the earth to allow the fill of four additional feet in breadth, so as to give 34 feet surface to the road.

In the estimates for all walls of masonry, care must be especially taken that their strength and thickness at bottom be well proportioned to

the pressure they may have to sustain, which pressure will, of course, vary with the greater or less degree of consistence in the soil. When hills are cut through, or the road dug along the side of a hill, the bank or banks should be cut of such slope as will be necessary to prevent the earth from falling or slipping in upon the surface of 30 feet. But, in these places, where from the steep ascent of the side of the hill to cut with such slope would be impracticable, the bank may be cut perpendicularly and side walls built to support the bank.

A ditch or water-course to be left or made on each side of the said surface of 30 feet and contiguous thereto, but when the road is dug along the side of a hill having an ascent exceeding 30 degrees, the ditch along the side of the hill may be dug within the width of 30 feet, so that the surface of the road, including the said ditch, may, in such cases, be only 30 feet in breadth. The ditches are, in every instance, to be of such breadth and depth, as will freely lead off the water, and prevent its rising and breaking in upon the road, and valleys or sewers to be made in all parts where they may be necessary or proper. The road to be covered 20 feet in width with stone, to be broken into pieces weighing not more than four cunes, in the following manner:

The bed of the road first to be formed nearly flat, having a slope of one inch in three feet from the centre to the sides. Twenty feet of the centre of the road to be covered three inches with clean stone broken as above.

No stones to be used but such as are hard or granite, flint, or limestone. The second year an additional covering of three inches will be put on, and afterwards an additional cover of three inches more, should it be found necessary. All the masonry must be done in the best manner, that is, durable in character, not extravagant in embellishment, but plain and strong, and of the best materials. When dry stone walls can be conveniently made, they are to be preferred, as they are generally made with more care, and not liable, when so made, to be pressed down, neither by the earth they have to sustain, nor are they liable to the operations of the frost. The smallest drains should be 18 inches wide, and the largest 24 inches. They should be made of dry masonry, and covered with large and flat stones.

Respectfully, your ob't. serv't,

HOWARD STANSBURY,

*U. S. Ass't. Civ. Engineer.*

EDWARD WATTS,  
*Civil Engineer.*

INDIANAPOLIS, Dec. 10th, 1835.

HOWARD STANSBURY, Esq.

*U. S. A. Civil Engineer.*

Sir—

In compliance with your invitation communicated to me in April last, to make an examination, survey, and estimate of a route for a rail road or turnpike, from Madison, by the way of Indianapolis, to Lafayette, agreeably to the acts of the Legislature of the State of Indiana at their last session, beginning the exploration at Madison, and report to you the probable cost of construction on the best probable route for either or both of the contemplated improvements; I have now the honor to submit to you with an estimate of the approximate cost for a rail road the requisite maps in plan and profile, illustrative of the following

## REPORT.

In order to attain the summit of the hills bordering the west bank of the Ohio river, experimental surveys were made of the several routes suggested by the varied features of the country, commencing at a bench mark, No. 1, at Madison, and following at first the sloping hill sides; thence up the north side of the valley of the Clifty creek; when within three-fourths of a mile from the summit, the steep hill side becomes a continuous perpendicular ledge of limestone rock, into which a cut of unusual extent is necessitated, or cross to the south side of the valley, which is a broken rocky hill side, and soon runs into a precipitous cliff of limestone, which would render the line, if feasible thus far, totally impracticable, as the summit level is 330 ft. above B. M. No. 1, in a distance of four miles. A branch falling into this valley from the north, known as the East Clifty, was next examined and found equally impracticable, the elevation at the falls being 237 feet above B. M. No. 1, and distance 2 3-4 miles.

Returning again to the B. M., a survey was made of the valley of Crooked creek, which after running north, bears gradually to the west, and presents a more favorable depression to attain the summit. After leaving the plain at Madison, the gradual side slope of the valley is followed, which at first is somewhat serpentine and necessarily crossing four short ravines, a more rapid ascent leads to the summit, which in 4 1/2 miles is 383 feet above B. M. 1, and more favorable than the valleys crossed, (not excepting Brisbane's Bluff, which rises in 3 1-5 miles, 365 feet), but would require an inclined plane to render the summit attainable. A rise of 260 feet in 1 mile horizontal would overcome the elevation, or an inclined plane could be located from a point in the immediate vicinity of Madison from the base to the summit of the hills by meeting an elevation of 330 feet in 3/4 of a mile level. Other routes in the vicinity of Madison were ocularly examined and found less feasible. After following up the river bank north and east of the town some two miles, the Eagle valley may be entered, which is less favorable in directness, and exhibits rather a succession of steps than a regular ascent, and as a consequence, necessitates more frequent excava-



tions and embankments, the latter of which would be expensive in crossing the unavoidable ravines which fall into the valley. But after some four miles the Eagle valley becomes almost inaccessible, and its summit higher than at the head of Crooked creek, and less practicable, as it would increase the distance to the summit two miles, and require a greater number of costly embankments. A more critical examination and further surveys would be necessary to determine the preferable site for an inclined plane, but from the general exploration made, which is all that is required in the experimental or preliminary survey, there is no hesitation in declaring the valley of Crooked creek favorable for the location of an inclined plane. Admitting the depot to be temporarily, if not permanently established on the bluff, in either event the nearest summit directly west of Madison, would be preferred, for which contingency estimates are herein submitted, as well as for the cost of an inclined plane directly from the base of the hill to its summit.

Having attained the summit level of the bluff, from the geography of the region to be explored, we are prepared to find the country broken by the numerous tributaries of the East Fork of White River, into deep valleys and elevated ridges transverse to a direct line from Madison to Indianapolis, and precluding the possibility of turning a valley to advantage. From the summit the line of survey traverses a gently descending and flat country, abounding with valuable white oak timber, and all the requisite materials to insure a stable and permanent foundation; thence across Harbor creek, to the middle fork of Big creek, where a slight deflection to the west embraces a more favorable opportunity for the erection of a bridge; whence on to Big creek, where a further divergency to the west is necessary to avoid two bridges in crossing this stream, by passing below the junction of the two considerable branches, at a narrow passage, where the banks are favorable for the construction of a bridge. The line is then prolonged nearly straight, over a gently undulating country to Camp creek, and on to Slaty run, gradually descending with it for a short distance, when to avoid too great a descent, obtain an early crossing of Graham creek, (16 miles from Madison) at a narrow pass in the valley where the banks jutting from the upland recommend undulations in the plane of the road, descending and ascending from 20 to 30 feet per mile, in order to equalize more nearly, and diminish the quantity of excavation and embankment; after which the line traverses ground of a more rolling character, intersected as it is by small branches tributary to Graham and their dividing ridges, rendering the plane of rail road undulatory and presenting no serious obstacles to the construction of the road bed, when the prolongation of the line of survey crosses the valley of the Muskakatak river, the bed of which is 105 feet above B. M. 1, at Madison, and 150 feet below the general level of the eastern ridge, one mile from it. Diverging from a straight line, a survey was made along the elevated ridge, which pursues a circuitous course in parallelism with the winding of the stream below Vernon; thence across the Muskakatak, and ascend to the western summit along the south west side of a branch falling into the river.



Notwithstanding this increase of distance by which the Muskakatak is crossed lower down, and consequently the total fall increased, it would involve a long and expensive embankment, and to attain the western summit an inclined plane. It was therefore abandoned, and returning back, it was ascertained the descent could be accomplished, by a gradual approach through a depression to Butler's branch which flows to the Muskakatak, and without exceeding the maximum range of undulation 30 feet per mile, and the occasional introduction of gentle curves the valley is pursued to advantage—the trace of the line occupying ground highly favorable to economy in the formation of the road bed, and cross the river at the confluence of the forks of the Muskakatak, inasmuch as it is less practicable to cross above in consequence of their dividing ridge of very considerable elevation and magnitude, and below, the stream is wider and its banks less favorable for the erection of a bridge. The apex of the ridge at the immediate fork being mostly of solid rock, and not subject to the corroding action of the stream, could easily be converted into a pier, and materially lessen the expense of bridging, the whole extent of which would not exceed 230 feet. After crossing the Muskakatak river, the ridge which directly presents itself indicates the route to be pursued, avoiding too great an elevation by not exceeding 30 feet per mile, and necessarily meandering along the hill sides of the West Fork, without conforming to their objectionable sinuosities, and attaining the western summit with moderate excavation and embankment, and they nearly equalized. After passing which, a straight line would lead into a country, interspersed with numerous isolated hills, which the line of survey avoids by bearing gradually to the west and passes over a gently descending and undulating country, when a descent of 20 feet per mile crosses the valley of the Six-mile creek, whence a gradual rise attains the summit of the ridge, dividing it from Big Sand creek. Passing over the general level of this ridge, we approach the waters of Big Sand creek, which are 80 feet below it, a gentle divergence again to the west is essential to meet the fall on the most favorable ground, and cross the stream below the mouth of the Wyloosing, a tributary to Big Sand Creek, and ascend to the summit of the west ridge by a uniform approach to it through the valleys which unite near its base when no obstacles interpose worthy of comment; the line crosses the valley of Nettle creek and arrives at Rock creek, which is the termination of the rock region. From Madison to this creek, abundance of good building stone can be obtained at a very moderate expense, as the stratifications on which the country is based, consist of secondary sand and lime stone, easily quarried, and in the immediate vicinity of the line surveyed. The prolongation of the line passes over a descending country, sometimes waving into occasional gravel hills, crossing Little Sand creek and Brush creek, both of which are inconsiderable and sluggish streams. When the plane of the road is coincident with the natural acclivity of the ensuing ridge which uniformly ascends for one mile 30 feet to the summit, leaving "Sand Hill" to the west, and thence direct through Clifty Hill, crossing the creek near Holloway's mill, and

gradually descends to the wide and beautiful bottom land west of Clifty Creek. The general features of the country here change their aspect to a broad and luxuriant plain, the natural surface of which requires scarce any preparation for the reception of the rails, and over which the line was run straight to the Flat Rock River, which may be advantageously crossed a short distance above its mouth.

In this rich and fertile country, which abounds with noble specimens of stately white oak; the valleys of water courses are bounded by ranges of sand and gravel hills running in parallelism with the streams, the bottom lands of which in some instances, expand to a width of two or three miles, and possess a soil, exuberant in a high degree, being nowhere infested with rocks or stones, and exhibit proofs of the greatest fecundity in the rankness of their vegetable products, while the beautiful area between them is a uniform plain, having no rise perceptible to the eye, and admirably adapted for the reception of a railway. After crossing the Flat Rock, the line of survey deflects to the north and runs direct along the plain, whence after avoiding the hills bordering Driftwood, and a gentle divergency to the west, it runs straight for several miles to Blue river, the plane of the road being coincident with and conforming to the regular and natural surface of the ground, which would require no other preparation than the clearing and grubbing of the timber to receive the superstructure or Rail Way.

The firm banks and narrow bottom immediately below the fall at Thompson's mill, indicate a favorable opportunity to cross Blue river and rise gradually between the hills which bound this stream, and Driftwood, or Sugar creek, as it is more generally known, above the mouth of Blue river, and thence directly along the uniform and fertile plain between them to within one mile of Sugar Creek, when the hills which bound it are avoided by a gentle deflection to the north, and a good crossing over Sugar Creek embraced above the mouth of Young's creek, traversing their dividing ridge above the source of the Big branch of Young's creek at a narrow passage with moderate elevation—thence the line of survey is run straight along the great ridge dividing the waters of the East and West Fork of White River, over a flat country, with a uniform ascent of 8 feet per mile to the summit, which is attained ten miles from Indianapolis, in which direction the face of the country is less uniform, and descending eleven feet per mile, requiring moderate excavation through gravel hills bordering the small and unimportant streams tributary to the West Fork of White River, and presenting no obstacles to the easy formation or graduation as it is termed of the road bed. To avoid the expense of bridging the several streams flowing between the Muskakatack and the East Fork of White River, an exploration was made west of the latter, beginning north of Franklin, through which town after numerous experimental surveys, the most feasible line was run. To avoid the ridge between it and Sugar Creek—the high and broken hills forming the west bank of Driftwood opposite the mouth of Blue river—and to obtain a more favorable crossing of Young's creek west of its principal branch, Hurricane creek, whence the most favorable route to the west valley of the Driftwood River, is



directly over the low and gently descending ground, broken respectively by Yellow Creek, Buckheart's Creek, Herriott's Creek and its branches, all of which are easily fordable, and seldom more than from 20 to 50 feet in width: thence the line continues straight east of Pleasant run, which flows rather on the surface than in a well defined valley; and after crossing the stream into which it runs, (Ninevah), arrive on the firm alluvial bottom land west of Driftwood, over which the line was prolonged, gently diverging to the east to avoid the hills of considerable altitude which approach abruptly within three hundred yards of the river at Arnold's mill, and then recede, necessitating the introduction of occasional curves to obtain the most favorable ground and avoid the river and its overflowed bottom. Thence the trace of the line is directly along moderate declivities and cultivated flats to the bend in the river above the mouth of Flat Rock, the plane of the road being coincident with the natural surface, which is highly favorable to economy in the easy formation of the road bed, crossing but one stream (Wolf creek) and that of no magnitude:—thence the most favorable route to the mouth of Big Sand creek, necessarily diverges to the east to escape the elevated hills running parallel with the river, traversing a wide and cultivated flat, and occupying for about two miles, the overflowed and marshy bottom from two to four feet in depth, which borders on the stream opposite the mouth of Big Sand creek, below which the Driftwood river is crossed, and would require a viaduct 320 feet in length. A line of exploration was then run straight in the direction of Madison, the country uniformly rising for three miles, when Mutton fork and its branches (a tributary to Muskakatack) are crossed, the country becomes more undulating and rolling, broken as it is by the several branches of Six-mile creek, the main branch of which is eighty feet below its banks—thence traversing an extensive flat densely wooded, and necessarily cross the valley of Indian creek, the bed of which is 110 feet below its banks, when the character of the country becomes more rugged, the direct line crossing the Muskakatack some four miles below Vernon, and descending 140 feet in the last half mile. Descending the east valley of the White river after crossing below the mouth of Big Sand Creek, an early crossing of the Muskakatack near the mouth of Six Mile creek, thence to Graham, and pursuing the valley of its tributary Big creek, which is favorable in direction, a feasible route, at the expense of a moderate increase of distance would seem to suggest itself from the geography of the country.

We therefore return to the point of crossing Six Mile creek by the first line of survey from Madison, whence a direct line was run, traversing a country gently descending and of a rolling character, broken by several inconsiderable branches of the Mutton Fork, all of which may be crossed with advantage by slight deviations from a straight line; after which the country assumes a less undulatory and waving aspect, when a gently sloping declivity leads to the flat bottom below the mouth of Big Sand creek, thus connecting the lines of survey east and west of the Driftwood river.

From Indianapolis the survey was continued across the West Fork

of White river below the National road bridge—to embrace the most favorable crossing—escape the wide bottom land above it, and the unnecessary expense in the erection of a bridge over Fall creek, and thence prolonged nearly straight to Danville, in which direction after crossing Little and Big Eagle creeks, the general level and character of the country is ascending and undulating, broken as it is by the White Lick and its tributaries, as Danville is approached the court house of which is 242½ feet above the state house at Indianapolis, or 452½ feet above B. M. 1, at Madison. From Danville, the immediate vicinity of which is quite broken, the survey was continued as straight as the rapidly ascending and rolling character of the country would permit, the ascent of which is such as to require an elevation of 35 feet per mile to attain the elevated ridge near Anderson's, dividing the waters of the White river from those of the Wabash flowing to the south and west; when after traversing the ridge the plane of the road bed is alternately descending and level until after crossing the first and second forks of El river. The line for the next three miles traverses a black swamp on which a permanent foundation could easily be secured by a simple grillage of plank and logs. Thence across Little Raccoon creek when the plane of the road descends through the next ridge, with a moderate cut to avoid too high an embankment over Big Raccoon creek, whence the line traverses a flat and sometimes waving country for the next 6 miles; the plane of the road alternately ascending & descending to conform to the general level, requiring however, occasional excavation thro' gravel hills; thence across Offield's creek, and rise gradually to its western summit, whence the descent is at the rate of 23 feet per mile, 4 miles to Crawfordsville, the general level of which nearly corresponds with the Bench Mark there made, which is 272½ feet above Indianapolis, or 482½ above Bench Mark 1 at Madison. From Crawfordsville, the most favorable crossing of Rock river or Sugar creek (the bed of which is 163 feet above B. M. 1), would necessarily be somewhat expensive, notwithstanding the crossing is effected on ground favorable as to foundation for the erection of a bridge, as the depth of the valley and its narrowest bottom is nearly 100 feet below the general level of the country on either side, and would require an embankment of very considerable elevation necessitating a deep cut for a short distance to form it, as well as to attain the general level after crossing Rock river—thence the line of survey in the direction of Lafayette, traverses a country for the next six miles gradually rising twelve feet per mile to the summit, which is eight miles from Crawfordsville, when the small and low growth of timber interspersed with meadow, is indicative of our proximity to the prairie. After passing the summit, the trace of the line crosses a beautiful expanse of the verdant Nine-mile prairie, occupying ground highly favorable to economy in the easy graduation of the road bed, requiring but occasional excavation in gravel swells of moderate height and declivity as the country descends almost uniformly fifteen feet per mile for seven and a half miles to the Wea creek, which is an inconsiderable tributary of the Wabash, flowing to the north east and gradually winds around to the west, crossing



twice a direct line from Crawfordsville to Lafayette. It may be entirely avoided at the expense of a trifling increase of distance by the introduction of a gentle curve after attaining the summit north of Rock river; thence diverge one and a half or two miles to the right of the straight line run and meander on the east ridge of the Wea, leaving the stream to the west. The direct line crosses it near its source, after which the country is undulating for the next six miles, when it is again crossed, whence an elevation of thirty feet for one mile attains the summit from which the plane of the road descends, crossing Durgie's run, and pursuing a valley which is tributary to it and favorable in direction: thence direct through the summit of the bluff and along the declivity to accommodate the grade of rail road to Lafayette, the court house of which is sixty-seven and a half feet above B. M. 1, at Madison. A large portion of the flat lands traversed by the line of survey from Madison to Lafayette may be appropriately denominated beech lands, the soil of which is usually thin and black, resting upon a bed of sand and gravel, and throughout the exploration the country sustains a heavy growth of trees, consisting principally in addition to the timber named, of white and black oak, poplar, sugartree, ash, hickory, elm, walnut, linn, maple, cherry, and in some places cotton wood and sycamore, most of which attain a gigantic size. From Lafayette an exploration was made direct to Indianapolis, and to attain the summit level of the range of hills running parallel with the Wabash, ocular examination was made of the several depressions leading to the summit, the most favorable of which lying between the roads travelled to Indianapolis was surveyed, which if it were not tortuous, its rapid ascent would render it impracticable, its summit being one hundred and sixty feet above the court house distant one and a quarter miles. We therefore returned to B. M. 40, on a swell of land comprising the eastern part of Lafayette—to render the elevation of the summit less, and thence proceed south and west along the acclivity of the hill sides, equalizing as near as practicable the quantum of excavation and embankment—avoid all expensive cutting by meandering below the brow of the hill, thence up the north-east side of the valley of Durgie's run, which at a narrow pass is crossed above Howard's mill, and attain the summit level (which is less elevated than directly south-east or east of Lafayette) without exceeding the maximum range of undulation. The line of survey is then run direct to Indianapolis over a flat country, the general level of which rises three feet per mile for four miles, when we unavoidably cross a range of gravel hills of thirty feet elevation which bound the western limit of the Wild Cat prairie. Without deviating from a straight line the ridge is crossed at the narrowest point, and the trace of the line traverses for the next three miles the prairie which rises twenty-five feet per mile, the plane of the road being nearly coincident with the natural surface which would require but little excavation through small gravel hills, after which the country is heavily timbered and the line prolonged straight, escapes Laurima creek and its breaks (tributary to the Wild Cat creek.) The general level is then uniformly rising fifteen feet per mile for four miles, the natural surface

of which is diversified by the skirts of prairie interspersed with isolated hills, in no instance exceeding an elevation of ten feet, and render the easy formation of the road bed highly favorable to economy. Retaining a common level, the same character of country may be said to extend for the next six miles to a very inconsiderable branch, Potato creek, after which the country sustains a dense growth of oak, hickory, and beech, the general level gently descending eight feet per mile for three miles, when the line of survey arrives at Sugar creek between the mouths of its tributaries, Wolf and Prairie creeks, 25 miles from Lafayette. To embrace the most favorable opportunity of crossing this stream, a deflection was made to the south, after which, if the straight line were resumed it would alternately cross Prairie creek and its marshy bottom several times. The result of the reconnoissance made, was confirmed by the line surveyed, which diverges to the south and gradually ascends the ridge dividing Prairie creek on the north from Wolf creek on the south, whence the prolongation of the line leaves a branch of the former (Deer creek) to the left. Thence a straight line was run traversing the great ridge dividing the waters of the Wabash from the White river, with a regular acclivity of ten feet per mile from Sugar creek fifteen miles to the summit, which is 450 above B. M. 1, at Madison, leaving the sources of Eel river, Raccoon and White Lick to the south, and thence prolonged, descending with the same uniformity of ten feet per mile over a flat country for eight miles to the head of School branch. A direct line to Indianapolis from the head of Deer creek, would run into the breaks of Eagle creek and its tributary Fishback, the beds of which are one hundred and ten feet below the general level on either side and would render their passage expensive. To embrace a more favorable opportunity of crossing Eagle creek and avoid all costly excavation and embankment, the line of survey was continued straight to the School branch, a small tributary flowing to the Eagle creek, some three miles below Fishback, and with a descent not exceeding thirty feet per mile, its valley is pursued for three miles over ground on which no obstacles interpose worthy of comment, to the easy graduation of the road bed. Thence crossing Eagle creek & its cultivated flat one fourth of a mile wide, & encounter an average cut of twenty feet for a short distance through the east range of hills, from the summit of which the country uniformly descends fifteen feet per mile, eight miles to the former line of survey immediately below the National road bridge. As favorable as this line is, an improvement may probably be effected by a further divergency to the south from the head of Deer creek, leaving the sources of Eel river, White Lick, &c., to the right, and the branches of Eagle creek to the left, crossing the latter below Miller's mill, where the hills on its west bank present a gradual declivity, and on the east almost entirely disappear. This would be but a trifling variation and increase of distance from a straight line—materially lessen the cost of forming the road bed over Eagle creek, and permit a more regular descent graduated according to the distance by avoiding the range of hills of considerable altitude on either side of Big Eagle creek which increase in elevation as we ascend the stream.



However, the character of the ground, occupied by the present line of survey direct from Lafayette to Indianapolis with very unimportant exceptions, is decidedly favorable to economy in the graduation and stability of the road bed; the trace of which being for almost the entire distance along moderate acclivities and uncultivated flats, presents no obstacles to the easy construction of a rail road.

But, a more adequate idea of the controlling features and general character of the country may be formed from an inspection of the topographical maps in Plan and Profile.

The distance from Madison to Lafayette for more easy reference, is divided into the eastern, middle, northern, first and second western divisions, the details of which I proceed to enumerate in order-

### THE EASTERN DIVISION

Comprises a distance of 28 miles from B. M. 1, at Madison, to the Six Mile creek. In the subjoined table, an estimate is presented for the graduation of an inclined plane from the base of the hill at Madison direct to the summit, rising 330 feet in three-fourths of a mile, horizontal. Should the depot be established on the summit, this expense will not be incurred.

That inclined planes should be avoided, if practicable, by a moderate increase of distance must be conceded, from the greater liabilities to interruption where stationary engines are used, but with the customary precautions not omitted in instances to be hereinafter adverted to, they are far more practicable than by many supposed. The difficulties or facilities incident to each particular stage or plane of inclination on this by far the most expensive division of the route will be best illustrated by an examination of the annexed table, exhibiting in detail the quantity of masonry, excavation, embankment, &c., with the cost of the same calculated for a road 24 feet in width, together with the length and inclination of the different stages, which it will be readily granted are well adapted to the advantageous use of motive power, whether it be animal or mechanical. It may suffice to state that the ground, generally, is favorable to the stability of the works, and that materials of excellent quality for the construction of the requisite masonry abound in the immediate vicinity of this part of the route.

*TABLE exhibiting the details of Grading, Masonry, Grubbing, Bridging, and cost of the same upon the different stages of the Eastern Division.*

No. of stage.	Locality.	Distance from Madison in miles.	Length of stages in miles.	Inclination per mile in feet.	Ascent of each stage in feet.	Descent of each stage in feet.	Cubic yards.		Masonry in perches.	Cost of Masonry.	Cost of clearing and grubbing.	Wooden bridges in running feet.	Cost of Bridging.	Total cost.
							Excavation.	Embankment.						
1	From b. m. 1 (41 ft. ab. h. water mark) to foot of inclined plane,	.32	.32	30.00	9.8		101,936	165,131	826	\$ 1,652	\$ 500	20	\$ 300	\$ 16,365 10
2	Plane straight,	1.17	.85	388.20	330.		13,792	73,345						18,840 48
3	Depot on the summit,	2.07	.90	28.50	25.6	2	58,144	23,209	266	532	126			3,713 00
4		3.51	1.44	1.40		10	29,547	67,121	48	96	273			12,740 00
5		4.42	.91	11.00		17	5,965	12,908	39	78	924			4,801 00
6		6.16	1.74	10.00			18,852	8,114	353	944	743	15	225	2,133 00
7	Across Harbor creek,	7.65	1.49	Level.	6	30	2,262	23,612	41	82	420			6,162 00
8		8.40	.75	8.00			18,033	4,834	2,683	9,837	407	20	300	1,265 00
9	Middle fork of Big cr.	9.46	1.06	29.00	6.5	1	10,240	37,026	84	168	197			17,208 00
10		10.05	.59	10.20			10,812	88,262						16,252 00
11		10.35	.30	3.30			49,208	1,706	18	36	223			1,953 00
12		11.25	.90	30.00		27	13,884	116,928	2,650	9,771	290	35	525	22,542 00
13	" Big creek,	11.85	.60	30.00	18.	24	20,144	10,145	575	9,771	336	25	375	11,951 00
14	" Camp creek,	13.14	1.29	18.58			22,573	13,853		1,519	420			5,537 00
15		13.83	.69	26.40	18.		12,245	10,307	76	152	378			3,764 00
16		14.97	1.14	4.38		5	64,584	34,032	3396	13,568	630	73	1,095	6,907 00
17	" Graham creek,	16.11	1.14	30.00	34.5		97,744	166,314	760	2,412	266	20	300	46,892 00
18		16.92	.81	1.70	1.5			67,680						22,527 00





## THE MIDDLE DIVISION

Comprises two routes. The first direct to Indianapolis, east of Driftwood river, crossing Rock and Clifty creeks, Flat Rock, Blue River, and Sugar creek, beyond the town of Franklin. The second diverges to the left, crossing Driftwood below the mouth of Big Sand creek, thence along the west valley through Franklin to the point of intersection with the former  $17\frac{1}{2}$  miles from Indianapolis. To the first several miles of either of these routes, the same remarks are applicable, as in the former division, relative to materials for masonry, and the difficulties or facilities of the different stages are in like manner exemplified by a table shewing the cost of graduating the road bed for either route.

TABLE exhibiting the details of Grading, Masonry, Grubbing, Bridging, and cost of the same upon the different stages of the Middle Division—ROUTE EAST OF DRIFTWOOD.

No. of stage.	Locality.	Distance from Madison in miles.	Length of stages in miles.	Inclination per mile in feet.	Ascent of each stage in feet.	Descent of each stage in feet.	Cubic yards.		Masonry in perches.	Cost of Masonry.	Cost of Clearing & Grubbing.	Wooden Bridges running feet.	Cost of Bridging.	Total cost.
							Excava- tion.	Embank- ment.						
26	From Six Mile creek	28.75	.75	27.1	20.5		27,702	8,042	33	\$ 66	\$			\$ 4,498 00
27		29.58	.83	level.			8,020	11,160	67	134	378	20		2,409 00
28	To Big Sand creek,	31.51	1.93	30		58.7	129,065	126,052	409	920	987	20	300	23,266 00
29	Across Nettle "	33.86	2.35	28.7	67.5		139,277	78,556	1,018	2,999	1,218	115	2,445	33,123 00
30	To Rock "	35.03	1.17	30		33.5	22,083	44,638	278	556	651			10,134 00
31	Across Rock "	35.72	.69	29.3	20		19,141	23,986	325	997	378	30	450	5,422 00
32		36.55	.83	30		25	11,982	30,290	138	276	462			5,433 00
33		37.05	.50	level.			15,384	2,048	20	40	273	25		2,082 00
34	" Little Sand "	38.37	1.32	23.45		31	34,588	24,890	142	363	525		375	5,759 00
35		38.79	.42	25.2	10.5		12,256	11,088			147			1,617 00
36		39.32	.53	level.			6,495	2,784	51	102	294			1,046 00
37		40.15	.83	30		25	11,792	13,001	86	258	462	35	525	3,195 00
38		41.50	1.35	30			16,495				743			2,602 00
39	" Clifty "	42.54	1.04	30	40.5	31	79,648	58,934	477	2,840	281	120	3,000	19,661 00
40		44.19	1.65	level.			21,373	17,522			617			3,609 00
41		45.42	1.23	2.9		3.5	23,007	27,251	156	858	260	80	1,440	6,646 00
42	" Flat Rock "	46.17	.75	1.33		1	1,238	11,922	238	1,487	294	150	3,750	7,319 00
43		47.31	1.14	2.9	3		4,733	2,211			294			767 00
44		48.69	1.38	13	18		867	2,427			554			845 00

45	50.71	2.02	4.5	9	5,618	10,382	77	231	827			2,407 00
46	51.85	1.14	6.1	7	6,046	2,124			630			1,235 00
47	53.59	1.74	5.2	9	777	395			588			666 00
48	56.01	2.42	lev'l		15,433	26,167	390	2,399	1,050	100	2,085	9,197 00
49	56.76	.75	11.9	9	9,424	6,769						1,225 00
50	58.31	1.55	5.8	9	5,503	11,674			861			2,546 00
51	59.61	1.30	lev'l		33,644	43,474	261	1,273	798	100	2,300	11,713 00
52	60.21	.60	16.5	10	14,961				336			1,981 00
53	60.90	.69	lev'l		1,638	962			378			547 00
54	62.21	1.31	30.	40	54,390	15,226	170	687	735	20	300	11,512 00
55	65.68	3.47	1.2	4	85,068	68,934	142	657	1,614	25	375	19,234 00
56	67.31	1.63	16.6	27	15,120	5,859			819			2,936 00
57	68.01	.70	29.	20	6,632	4,840			365			1,061 00
		40.01		324	210.7	739,450	698,608	4478	17143	\$	\$17,819	\$205,693 00



TABLE exhibiting the Details of Grading, Masonry, Grubbing, Bridging, and Cost of the same, upon the different stage of the Middle Division—ROUTE WEST OF DRIFTWOOD.

No. of Stage.	LOCALITY.	Distance from Madison in Miles.	Length of Stages in Miles.	Inclination per mile in Feet.	Ascent of each Stage in Feet.	Descent of each Stage in Feet.	CUBIC YARDS.		Masonry in Perches.	Cost of Masonry.	Cost of Clearing & Grubbing.	Wooden Bridge—Running Feet.	Cost of Bridging.	Total Cost.
							Excavation.	Embankment.						
26	From 6 Mile creek	28.36	.36	22.2	3.	85.	19,698	36,723		\$	\$ 197			\$ 2,757 00
27	Across 5 branches of Mutton cr.	33.62	5.26	16.14		7.	315,782	377,603	2,811	8,625 75	2,919 120	\$ 1,900		88,966 75
28	To mouth of Big Sand creek	35.32	1.70	4.12				40,569			319			8,121 00
29	Across Driftwood	37.06	1.74	level.			159	31,365	570	3,121 50	966 335		10,710	20,452 50
30	" overflown bottom	38.36	1.82	2.1	4.		2,456	11,879	60	180 00	378			2,696 00
31	"	41.23	2.35	4.25	10.		15,867	8,792			1,134			3,355 00
32	" Deer creek	43.62	2.39	3.85	9.		9,858	10,294	33	184 80	651 10		150	2,529 00
33	" Mitchell creek	46.32	2.70	4.92	13.3		9,505	14,585	33	165 00	1,092 12		180	3,425 00
34	" branch of do.	48.37	2.05	.74	1.5		8,017	11,593	167	907 70	1,008 60		900	4,554 70
35	" Catarine creek	49.24	.87	8.00	7.		2,733	671	108	604 80	438 10		150	1,527 80
36	"	50.37	1.63	.6	1.		6,651	6,757	29	37 00	189			1,222 00
37	" Guthrie's creek	51.62	.75	13.2	10.		6,699	3,802	73	365 00	420 30		450	2,039 00
38	"	52.83	1.21	2.1	2.5		6,112	10,339	97	291 00				1,583 00
39	" Saylor creek	53.49	.66	5.3	2.5		16,232	3,105	63	330 75	155 10		150	1,965 75
40	" Lick creek	55.88	2.39	2.66	6.		11,148	17,751	136	739 55	1,323 40		600	5,324 55
41	" Ninevah creek	56.75	.87	13.2	10.		296	10,240	215	917 75	420 50		750	3,623 75
42	"	57.05	.30	23.1	7.		4,820				168			746 00
43	"	57.96	.91	29.7	27.		5,167	1,109			504			1,073 00
44	"	59.70	1.74	11.47	20.		29,162	14,561			966			5,049 00



To estimate the relative advantages and lengths of these two routes, it now becomes necessary to take into consideration the combined effect of friction and gravity, which, together, may be said to constitute the sole impediment to locomotion on a rail-way. The only resistance on a level being the friction at the axles of the carriage, the relative resistances of different inclinations compared with a level, must depend on the ratio affixed to friction, compared with gravity: and consequently, as the friction of carriages shall be reduced, so will the advantages of a level route predominate. The precise amount of resistance created by friction, will, of course, depend upon the nature of the substances in contact at the axle, as well as the proportional dimensions of the wheel and axle. Friction upon rail-ways, which, indeed, may be said to constitute the very basis of the rail-road system, has, within a few years past, undergone great and important reductions, and it may be that the ulterior limit to which its ratio has been approximating, is not yet attained. By imperfect experiments, it was supposed to be 1-176 of the weight, or one in 176, which equals an elevation of 30 feet per mile, and hence a steam engine with a given load, would travel one mile and rise 30 feet or two miles on a level at the same cost of time and power. But practically, Mr. Wood in his recent treatise on rail-roads, has thought it safe to assume it at 1-240 of the weight, and hence on an inclination of one in 240, which equals an elevation of 22 feet per mile, the resistance would be doubled as the gravity would become equal to the friction, or to surmount an elevation of 22 feet would be equivalent to an increased distance of one mile on a level as regards time and the cost of the moving power.

More recent improvements in this country have reduced the friction of rail-way carriages below the standard established by Mr. Wood. By the official Reports of the Engineer of the Baltimore and Ohio Railroad Company, we learn that with the "Winans Car," the peculiarity of which is in its axles, which work in friction wheels, it has been found not to exceed 1-448 of the weight, and making due allowance for defects, the traction will be 1-400 of the weight of car and load, in which case, the comparatively trifling elevation of 13.2 feet would equal one mile level. Nevertheless, the more experienced engineers in our country consider the ordinary results of practice as exhibited by Mr. Wood, most entitled to confidence, from which the following conclusions will be drawn: Inequating the lengths of the two routes, descending planes are regarded as levels, and each 22 feet of elevation equivalent to an increase of one mile. The maximum speed consistent with safety being that maintained on the level portions of the road. From these premises, the following table has been constructed exhibiting the total ascents of either with actual and equated lengths:

Designation of the route	Total descent in feet.	Total ascent in feet.	Actual Length.	Equivalent length.	Total cost of graduation.
Direct route to Indianapolis, crossing Flat Rock, Blue river, & Sugar Cr.,	210.7	324.0	40.01	54.74	\$205,693 00
To the mouth of Big Sand Cr., and west of Driftwood river.	100.0	213.3	43.08	52.78	\$202,896 79

### THE NORTHERN DIVISION

Comprises the interval between the union of the two routes, east and west of Driftwood river and Indianapolis, a distance of  $17\frac{1}{2}$  miles. The difficulties or facilities incident to each particular stage are best illustrated by the subjoined table.



*TABLE exhibiting the details of Grading, Masonry, Grubbing, Bridging, and cost of the same upon the different stages of the Northern Division.*

No. of stage.	Locality.	Distance from Madison in miles.	Length of stages in miles.	Inclination per mile in feet.	Ascent of each stage in feet.	Descent of each stage in feet.	Cubic yards.		Masonry in perches.	Cost of Masonry.	Cost of Clearing & Grubbing.	Wooden Bridges in running feet.	Cost of Bridging.	Total cost.
							Excava- tion.	Embank- ment.						
58	Across Indian creek	68.54	.53	1.88	1.	1.	7,804	12,297	114	\$ 477	\$ 294		\$ 225	\$1,113
59	"	70.21	1.67	14.	21.5		7,033	12,297			895	15		3,072
60	"	72.41	2.20	8.6	19.		15,930	17,471			1,213			3,227
61	Summit near Smocks	74.38	1.97	level.			103,745	74,826			1,092			19,776
62	Main f'k Pleasant run	76.05	1.67	12.		20.	10,881	8,113	220	664	1,029	35	525	3,524
63	2d fork of "	78.02	1.97	13.7		27.5	44,896	29,008	156	721	1,092	40	600	9,596
64	Buck creek	79.68	1.66	5.4	9.	9.	31,973	28,619	305	1,221	1,029	35	525	7,251
65	Lick creek	80.70	1.02	26.45		26.5	26,041	57,453	227	986	567	50	750	11,495
66	"	81.21	.51	level.			24,123				281			3,176
67	3d fork of Pleasant run	83.28	2.07	12.8		26.5	39,084	35,473	48	144	1,146			7,934
68	Pogue's run	85.51	2.23	level.			43,986	28,173	528	2,376	1,861	50	750	12,904
			17.50		40.5	110.5	355,496	291,433	1,598	\$6,589	\$10,504	225	\$3,375	\$83,068 00

## THE FIRST WESTERN DIVISION

Includes the remainder of the route via Danville and Crawfordsville to Lafayette. The cost of bridging the several streams necessarily crossed by this part of the route will be materially enhanced by the difficulty in procuring suitable building stone for the requisite masonry, which cannot be obtained within 11 miles of the route, except at Big Raccoon creek and at Crawfordsville, where good sand stone may be had within two miles of the line. The planes of the road bed may be considered favorable, if the 81st stage is excepted, the elevation of which being necessarily 35 feet per mile to attain the summit of the ridge at Anderson's, which is 537 feet above B. M., at Madison. The difficulties or facilities incident to each stage are exemplified by the following table.

**TABLE exhibiting the details of Grading, Masonry, Grubbing, Bridging, and cost of the same upon the different stages of the First Western Division.**

No. of stage.	Locality.	Distance from Madison in miles.	Length of stages in miles.	Inclination per mile in feet.	Total ascent of each stage in feet.	Total descent of each stage in feet.	Cubic yards.		Masonry in perches.	Cost of Masonry.	Cost of Clearing & Grubbing.	Wooden Bridges in running feet.	Cost of Bridging.	Total cost
							Excava- tion.	Embank- ment.						
69	To W. fork of White R.	86.08	.57	26.33	13.	15.	12,021	564	729	\$ 3,768	\$ 1,218	515	\$ 14,475	\$ 1,803
70	Across "	89.03	2.95	4. 4	13.		39,618	33,728	380	1,829	1,512	115	1,965	25,998
71	To Big & Lit. Eagle crs	91.76	2.73	30. 8	84.		132,087	21,561						30,402
72		93.12	1.36	14.58		20.	12,672	5,725	596	3,186	756			2,529
73	" 3 small branches "	95.86	2.74	26.25	74.		26,976	43,473			1,520	55	825	12,921
74		97.17	1.31	level.			3,726	3,522	39	117	735			1,299
75		97.53	.36	16. 6		6.	454	155	54	162	197			413
76	To Lit. White Lick,	98.89	1.36	29. 3		40.	44,520	87,455	539	2,405	630	20	300	19,076
77	Across White Lick,	100.44	1.55	27. 9	43.5		69,879	133,924	862	4,082	861	75	1,350	30,902
78	" branch of "	102.41	1.97	32. 9	63.		40,738	76,651	1,031	4,839	840	80	1,440	21,682
79	" br. of Big White L.	103.16	.75	29. 7		22.5	391	14,577	158	474	252			2,694
80	" branch of "	104.14	.98	7. 1		7.	38,023	21,870	108	324	462			5,349
81	" Big White Lick,	106.74	2.60	35.	90.		194,714	145,905	1,714	8,994	1,167	65	975	50,078
82		107.49	.75	level.			2,110	54,093	201	606	294			8,473
83	To sum't at Andr's ns	108.47	.98	27. 9	26.5		162,076	22,767	29	145	546	15	225	33,331
84		110.13	1.66	30. 9		51.5	164,037	234,981	765	3,676	924	10	150	55,271
85		111.42	1.29	level.			6,587	23,835			714			4,289
86	Across 1st & 2d cr's	112.71	1.29	31.		40.	50,864	579	39	117	714			7,443
87	of Eel river, }	114.07	1.36	level.			4,078	153,125	1,751	11,003	756	125	2,115	39,906







## THE SECOND WESTERN DIVISION

Comprises the direct route from Lafayette to Indianapolis, the graduation of which may be effectuated with great economy, as will be perceived by the annexed table.

*TABLE exhibiting the Details of Grading, Masonry, Grubbing, Bridging, and Cost of the same, upon the different stages of the Second Western Division.*

No. of Stage.	LOCALITY.	Distance from La- fayette in miles.	Length of Stages in Miles.	Inclination per mile in Feet.	Total Ascent in Feet.	Total Descent in Feet	CUBIC YARDS.		Masonry in Perches.	Cost of Masonry. \$	Cost of Clearing & Grubbing. \$	Wooden Bridge— Running Feet.	Cost of Bridging. \$	Total Cost.
							Excava- tion.	Embank- ment.						
1	Across Spring Branch	1.14	1.14	29.9	34.		33,141	69,922	672	2,623	168	10	\$ 150	\$ 16,925
2		1.44	.30	13.2	4.		18,746	3,303	126	378	168			3,920
3		1.74	.30	level.			42,993	11,361	332	996	168			9,118
4	Across Durgie's run	2.64	.90	29.75	26.5		42,012	60,860	1,152	4,710	407	10	150	17,449
5		4.84	2.20	1.4	3.		2,206	11,436			953			2,554
6	Wild Cat prairie	7.66	2.82	9.6	27.		241,237	114,432	63	189	428			43,864
7	"	10.01	2.35	27.45	65.		37,447	21,669						4,681
8	"	11.91	1.90	1.05	2.		6,144	30,691			336			4,326
9		14.49	2.58	16.7	43.		16,797	22,693			378			3,442
10		16.04	1.55	10.6	16.5		22,296	19,532			147			3,491
11		17.46	1.42	3.5		5.	21,374	20,091			785			4,205
12		18.20	.74	28.3	13.5		11,519	11,609			155			1,664
13	Potato creek	19.34	1.14	9.68	11.		13,200	26,755	197	1,231		15	225	5,063
14		19.94	.60	25.	15.		9,895							1,039
15		21.15	1.21	level.			10,477	14,595			672			2,715
16		21.58	.43	14.8	9.		3,744	,639			336			,732
17		23.43	1.90	13.73		26.	4,677	39,585			1050			7,384
18	Sugar creek	24.84	1.36	level.			34,933	39,169	403	2,519	756	80	1,440	11,765
19		25.98	1.14	30.00	34.5		17,408	10,345			210			3,343

	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Across branch of Prairie cr.	26.51	27.42	29.79	31.74	32.12	32.65	34.16	36.66	37.35	39.85	41.25	42.05	43.64	45.64	46.94	48.49	51.50	52.94	53.47	54.47	55.42	56.29	57.20	58.17	59.86	60.50
	.53 level.	.91 30.00	2.37 15.1	1.95 9.5	.38 level.	.53 8.5	1.51 level.	2.50 5.6	.69 level.	2.50 6.4	1.40 9.6	.80 13.8	1.59 12.5	2.00 3.5	1.30 7.04	1.55 13.5	3.01 30.00	1.44 level.	.53 30.00	1. 15.5	.95 30.00	.87 5.7	.91 level.	.97 22.8	1.69 6.8	.64 27.00
	27.5	32.	18.5	4.5	14.	16.	13.5	11.	20.	7.	9.2	21.	90.3	15.5	15.5	23.4	5.5	22.	11.5	17.2						
	3,831	6,946	28,152	8,353	,000	2,417	3,644	17,464	5,058	14,402	4,167	5,350	10,192	26,859	2,173	4,559	98,037	124,285	2,717	4,511	2,235	,136	2,721	3,777	18,343	12,021
	23,640	4,208	13,519	13,941	3,489	2,400	3,196	12,856	5,448	11,998	6,052	3,438	19,987	14,541	3,461	4,125	96,222	175,689	5,988	3,351	,255	2,025	5,889	4,802	29,444	,564
	70	350	291	10	150	294	840	1,386	378	1,386	777	441	882	1,113	576	861	1,667	630	168	504	525	438	126	197	617	2,968
	150	10	1,310	1,079	210	294	840	1,386	378	1,386	777	441	882	1,113	576	861	1,667	630	168	504	525	438	126	197	617	2,968
	150	10	1,310	1,079	210	294	840	1,386	378	1,386	777	441	882	1,113	576	861	1,667	630	168	504	525	438	126	197	617	2,968
	150	10	1,310	1,079	210	294	840	1,386	378	1,386	777	441	882	1,113	576	861	1,667	630	168	504	525	438	126	197	617	2,968
	150	10	1,310	1,079	210	294	840	1,386	378	1,386	777	441	882	1,113	576	861	1,667	630	168	504	525	438	126	197	617	2,968
	150	10	1,310	1,079	210	294	840	1,386	378	1,386	777	441	882	1,113	576	861	1,667	630	168	504	525	438	126	197	617	2,968
	150	10	1,310	1,079	210	294	840	1,386	378	1,386	777	441	882	1,113	576	861	1,667	630	168	504	525	438	126	197	617	2,968
	150	10	1,310	1,079	210	294	840	1,386	378	1,386	777	441	882	1,113	576	861	1,667	630	168	504	525	438	126	197	617	2,968
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	150	10	1,310	1,079	210	294	840	1,386	378	1,386	777	441	882	1,113	576	861	1,667	630	168</							



A comparison between the two last divisions may be made by contrasting the difference of elevation and of the actual and equated lengths as was instituted on the Middle Division, on similar premises is the subjoined table constructed:

Designation of the route.	Total descent in feet.	Total ascent in feet.	Actual length.	Equated length.	Total cost of Graduation.
From Indianapolis via Danville, Crawfordsville, to Lafayette,	778.5	666.5	74.25	104.55	\$859,417 00
From Indianapolis direct to Lafayette,	422.7	310.7	60.50	74.62	\$288,428 00

It will be readily conceded that the only resistance which can obtain on a level is the friction at the axles. Hence, the friction of one ton on a level, will depend upon the speed with which it is impelled, and as the plane of the road varies from a level, so will the resistance be augmented by gravity, which increases directly as the height of the plane in all the intermediate degrees of elevation to a rise, whereat the gravity equals the friction, when the resistance, and consequently the load is doubled. The friction of one ton on a level is usually considered equal to twelve pounds, consequently a horse will draw as many tons as he can twelve pounds on a common road: but from experiments recently made on the Liverpool and Manchester Rail Road, to ascertain the friction and requisite power or weight to move a given load on a level Rail-way, the following results were obtained:\*

The carriages and weight were moved along the road at various speeds, and with 10, 15, 17, and 19 lbs.

One pound moved at the rate of  $4\frac{1}{2}$  miles per hour - 334 lbs.

One pound " " 3 " " - 470 lbs.

One pound " "  $2\frac{1}{2}$  " " - 616 lbs.

Hence, estimating the average muscular energy of a horse as equal to 150 lbs. traction, the result will be equal to 41 tons drawn on a level by a single horse, at  $2\frac{1}{2}$  miles per hour, at which speed his useful effect will be a maximum. From which it would appear that the power of a horse on a Rail-way at a slow speed, may be brought to approximate much nearer to his power on a canal, than perhaps is generally imagined.

All motive agents, mechanical as well as animal, are capable of exerting, occasionally, for a short time, twice the power that their regular and constant average work or movements require, when the effect produced is a maximum. This alike accords with theory and daily experience. Hence, the planes of a Rail-road should not have an elevation requiring more than double the power necessary on the level portions of the road; otherwise there would be a loss of effect, when compared with the cost of transmit.

\* Stillwell's Report on Rail Roads and Canals to the New York Legislature.

When two surfaces are in contact, a certain force is necessary to cause them to slide upon one another: the property of a body to resist this sliding motion, is called adhesion, the amount of which a locomotive engine can spare to its load, above that required to propel itself forward, is inversely as the height of the plane is to its length. If the elevation of the plane on which the engine is to travel, equals 1-20 of its length; the whole adhesive power of the engine will be required to ensure to itself a progressive motion, notwithstanding the late experiments on the Baltimore and Ohio Rail Road, by which an engine was made to ascend an elevation from 35 or 40 to 260 feet per mile, effected simply by increasing the weight of the engine and its consequent adhesion to the rail.

In the event of the construction of the Madison, Indianapolis, and Lafayette Rail Road—and it be considered expedient, eventually, to have the depot at Madison, in order to overcome the elevation of the summit, it may be necessary to resort to stationary power; which, whether it be animal or mechanical, can at any time be duly proportioned to the demands of trade: that the steam engines may be of suitable capacity, and the amount of capital to be invested in them not unnecessarily enlarged, their erection might be temporarily deferred, and the transportation meanwhile across the plane be effected by the use of horses, until the imperative demands of trade require the substitution of stationary steam engines.

The machinery of an inclined plane is quite simple, indeed, independent of the stationary power; it may be said to consist merely of sheeves or rollers (made of cast iron) placed in the middle of the road-track, to sustain the rope or chain to which the cars are attached, while the graduation of the road-bed for the reception of the rails differs only in the slope or inclination which it may be required to assume, and the operation of the engine throughout the length of the plane is so obvious that it is scarcely necessary to say, that by means of a rope or chain, one end of which being attached to a train of cars, and the other passing around a sheeve wheel or drum around which the rope is wound by the action of the engine with a speed proportionate to its power. A part of this power is of course expended in overcoming the gravity of the load, and just so far as this may be the case, is the cost of transportation increased beyond what it would be on a level road: this cost may be partially diminished by attaching the end of the rope after passing around a horizontal sheeve wheel, to a train of weight cars (or wagons loaded with stone and kept for this purpose) which move in a opposite direction upon a parallel second track on the plane. On an inclined plane, the power acts parallel to the plane; hence the length of the plane is to the load as the elevation of the plane is to the requisite power.

Inclined planes with stationary power are successfully resorted to in our country. On the the Mohawk and Hudson Rail Road—Baltimore and Ohio Rail Road—Alleghany Portage Rail Road—the length of the latter is  $36\frac{1}{2}$  miles, on which are ten inclined planes; and in the first ten miles ascend 1399 feet. But this mode of conveyance is yet

more extensively resorted to in Great Britain, from a level to far greater inclinations than would be required in this case. In the rugged and mountainous country of South Wales, at a slope exceeding 10 deg., or an elevation of 931 feet per mile: and in one instance, they have a succession of planes, the slopes of which are from 15 to 20 deg., and the trade is as uninterruptedly conducted as upon a level road.

In the estimated cost submitted, is included that of requisite engines and machinery for the passage of an inclined plane.

## CONSTRUCTION OF THE RAIL WAY.

A great extent of the road-bed would not, for a long time after its graduation, be suitable to so expensive a system of foundations as stone sills or blocks embedded on rubble, were the question settled as to its decided preference.

Wooden sleepers transverse, and white oak logs underneath (lengthwise of the road to prevent the unequal and partial settling of the earth), being less liable to derangement than stone blocks, or sills on rubble, would, in my estimation, be better adapted to the country—postponing a more expensive and permanent structure to the construction of a second track, if deemed requisite by the amount of traffic, when the embankments shall have become consolidated, the cost of which would be materially reduced by the use of the rail way in transporting the necessary materials.

I shall present estimates of three different forms of superstructure, equally effective in character, but differing materially in first cost and durability.

1. The wrought iron flat rail, 24 inches in width by 5-8 inches in thickness, on wooden string pieces.

2. The edge rail having a continuous flat base, 3½ inches wide, resting upon scantling 6 by 8 inches square, of locust, pine, or oak: the rail 2 inches high, and weighing 32 pounds to the yard.

3. The most approved edge rail of the H form and of uniform depth, dispensing with the necessity of cast iron chairs, as arranged by Major McNeile, Chief Engineer of the Boston Rail Roads: which, besides its more obvious advantages, presents a cleaner way, and permits a more perfect drainage of the road bed, being less liable to obstructions from ice and snow: but whether it possesses advantages over the flat rail, in the present instance equal to the difference of cost may be deemed worthy of consideration. The usual foundations, whether for support of stone blocks, continuous sills, or wooden sleepers, are as readily secured from derangement by frost or other causes, and, indeed, are the same, whether the rails be wood or iron: the edge rail is therefore as applicable to the green state of the road bed as the flat rail on wooden strings.



The estimate of the flat rail delivered on the road, will be as follows:

Cost in Liverpool, per ton	\$31 10
Freight to New Orleans	2 50
Exchange, insurance, and commission, $13\frac{1}{2}$ per cent.	4 20
Shipping charges, inland transportation	11 20

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Total cost per ton \$49 00

The estimate of the edge rail delivered on the road will be,

Cost in Liverpool, per ton,	\$40 00
Freight	2 50
Exchange, insurance, &c., $13\frac{1}{2}$ per cent.	5 40
Shipping charges, &c. &c.	11 20

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Total cost per ton \$59 10

Estimate for one mile of Rail Way, single track, with flat rail:

22 tons flat rail, 24 by 5-8 inches, at \$49	\$1,078 00
782 lbs. iron spikes, at 9 cts., for confining rails to string pieces	70 38
713 lbs. splicing plates, at 9 cts., to be placed under ends of rails	64 17
31,680 feet of oak or pine string pieces, 6 by 8, at \$26 per M. feet	823 68
1,760 sleepers of oak or black locust, every 3 feet, at 25 c.	440 00
10,560 feet longitudinal sleepers or bearing timber, at 3 c.	316 80
1,040 yards of excavation for " " at 10 c.	104 00
Dressing and notching sleepers, at 10 c.	176 00
Laying sleepers and strings, at 15 c.	264 00
Wooden wedges to confine the string pieces, 3520, at 2 c.	70 40
Laying rails and fitting splicing plates under joints, at 2 c. per yard	35 20
Horse tread of gravel	300 00

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Total cost \$3742 63

Estimate for one mile of Rail Way, single track, edge rail on scantling:

50 tons edge rail, at \$59 10	\$2,955 00
480 lbs. spikes, at 8 c.	38 40
String pieces	823 68
Transverse sleepers	440 00
Longitudinal sleepers	316 80
Excavation for " "	104 00
Dressing and notching sleepers	176 00
Laying sleepers and strings	264 00
Wedges	70 40
Laying rails	35 20
Horse tread of gravel	300 00

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Total \$5,523 48



Estimate for one mile of Rail Way, single track, with approved edge rail:

55 tons edge rail, at \$59 1c	-	-	-	-	\$3,250 50
640 lbs. spikes at 8 c.	-	-	-	-	51 20
1,760 sleepers at 25 c.	-	-	-	-	440 00
10,500 feet longitudinal sleepers, at 3 c.	-	-	-	-	316 80
1,040 yards of excavation for "	-	-	-	-	104 00
Dressing, notching, and laying sleepers	-	-	-	-	362 00
Laying rails	-	-	-	-	176 00
Horse tread of gravel	-	-	-	-	300 00

Total - - - - - \$5000 50

From these estimates, the cost will be with the flat rail, 146

miles, at \$3,742 63 dollars per mile	-	-	-	\$546,423 98
For 3½ miles of turn-outs	-	-	-	13,099 21

\$559,523 19

For the edge rail on scantling 146 miles, at \$5,523 48  
per mile

For 3½ miles of turn-outs	-	-	-	806,428 08
	-	-	-	19,332 18

\$825,760 26

For the most approved form of edge rail, 146 miles, at

\$5000 50 per mile	-	-	-	730,073 00
For 3½ miles of turn cuts	-	-	-	17,501 75

\$747,574 75

When it shall be deemed advisable to pass the inclined plane by means of stationary steam engines, their cost, with that of the requisite fixtures and machinery, such as engine house, ropes, drums, and sheeves, will be

\$6,975 00

From the foregoing estimates, the aggregate cost of a Rail Road, from Madison direct to Indianapolis and Lafayette, if constructed with the flat rail, will be, agreeably to the following

### SUMMARY.

For formation of road bed	-	-	-	\$948,772 58
Rail Way and turn-outs	-	-	-	559,523 19
Contingencies ten per cent.	-	-	-	150,829 58
Stationary Steam Engine and fixtures	-	-	-	6,975 00

1,666,100 35

If constructed with the most approved edge rail, the estimate for rail way and turn-outs will be \$747,574 75, which if substituted in place of the corresponding item in the summary gives for the aggregate cost \$1,854,151 91; these sums divided by the distance we have \$11,411 64 per mile with the flat rail and \$12,700 00 per mile with the most approved edge rail.

Should it be deemed expedient in the incipency of the operations of the work to construct the rail way on rubble or broken stone (instead of logs underneath and lengthwise of the road) as practised on numerous rail roads now in operation in our country, the second item of the above summary would be enhanced 1380 dollars per mile.

If the depot is established on the summit at Madison, the aggregate cost with the flat rail will be agreeably to the following

#### S U M M A R Y :

Formation of road bed	-	-	-	-	913,567 00
Rail way and turn-outs	-	-	-	-	553,909 25
Contingencies ten per cent	-	-	-	-	146,747 62
					<hr/>
					\$1,614,223 87

If constructed with the approved edge rail, the estimate for rail way and turn outs will be \$740,074 00, which would increase the aggregate cost to \$1,600,388 62. These sums divided by the distance, 144½ miles, we have \$11,171 10 per mile with the flat rail, and \$12,459 43 per mile with the edge rail.

From Indianapolis to Danville, Crawfordsville, and Lafayette, the cost of a rail road with the flat rail, will be agreeably to the following

#### S U M M A R Y.

For formation of road bed	-	-	-	-	859,417 00
Rail way	-	-	-	-	277,890 28
Turn-outs one and a half miles	-	-	-	-	5,613 94
Contingencies ten per cent	-	-	-	-	114,292 12
					<hr/>
					\$1,257,213 34

If constructed with the approved edge rail, the estimate for rail way and turn-outs, will be \$378,787 87, which would increase the aggregate cost to \$,1352,496 99. These sums divided by the distance, 74½ miles, we have \$16,932 16 per mile with the flat rail, and \$18,215 44 per mile with the edge rail.

**WIDTH OF THE ROAD.**—A graduated surface from thirteen to fifteen feet in width, occasionally increased a few feet to admit of passing places, would afford ample space for one track: but a rail road designed to accommodate a general trade, should be graduated for a double set of tracks, notwithstanding the trade may be managed with but little interruption on one track with occasional turn-outs—the consolidation of the surface for a second track when it shall be required, and the necessity of using more costly and less perishable material in the first instance; from the interruption which must otherwise ensue in renewing a single track, more than outweigh the increased cost of a graduation for two tracks, which is not enhanced in proportion to the width. Time will not permit a precise calculation of the difference of cost by the diminished width of road bed and consequent reduction of excavation and embankment; but it may be safely estimated in the present instance at 23 per cent. The total length of the proposed rail road from Madison to Indianapolis, is 85½ miles, the total ascents and

descents 1534.6 feet; the average rate of ascent from Madison is 10.2 feet per mile, and deducting the elevation of the inclined plane, is 6.23 feet per mile. The effect of gravity upon this inclination is 2.64 lbs. per ton. From Indianapolis, the average ascent is 3.76 feet per mile, and the effect of gravity is 1.60 lbs.—hence the average power required to move one ton to Indianapolis, is 10.37 lbs., and to Madison 8.29 lbs. The greatest power required either way is 22.06 pounds per ton: by varying the velocity with the power necessary to move upon the different inclinations of the road, a locomotive engine weighing but 4 tons, may draw at a rate averaging

6 miles per hour	-	-	-	-	36 tons
15 “ “	-	-	-	-	15 “
20 “ “	-	-	-	-	10 “

and a horse may draw up the greatest elevation at

5 miles per hour	-	-	-	-	3½ tons
10 miles per hour	-	-	-	-	2 tons*

The estimated price for the formation of road bed varies from ten to twenty-three cents per cubic yard, and is based upon the details of the several excavations and embankments, which have respectively equal and two-third slopes, with a view as well to the supposed degree of tenacity of the materials to be excavated, as the distance to be hauled; the cost of which may be materially reduced, if the use of temporary rail ways be resorted to, as is frequently the case, for the removal of earth and other materials into the embankment.

Dry masonry, viz: without the use of mortar, is generally contemplated. The stones being dressed to a fair and equable bearing, and laid with a single view to strength and solidity: under these circumstances, the assumed cost of the masonry varies from 2 to 6.50 dollars per perch, in proportion to the character of the structure and proximity of suitable building stone.

For the passage of established water courses, the estimate provides for efficient wooden bridges, the floors of which would form a roof impervious to the water and securely protect the timbers beneath from the weather. The assumed average cost of grubbing and clearing is \$550 40 per mile. There are no objectionable curvatures on the route, as with but few exceptions, it is virtually straight.

The present line of survey from Madison to Lafayette may be considered as merely experimental, and instituted with a view to ascertain the practicability of a rail road, rather than approximate the definite location. The result proves conclusively the feasibility of the contemplated rail road, both as regards the planes of inclination, admitting almost throughout the entire route, an economical use of locomotive power, and the comparatively moderate cost at which this desirable object may be attained.

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\* Mr. Wood states, that 32 horses on a rail road, would do the work of 240 horses on a common turnpike road: or a locomotive engine on a rail way, travelling at the respective rates of 10 and 15 miles per hour, will perform the work of 240 horses on a turnpike road.



The estimates amply provide for contingencies, the occurrence of which, I feel assured, will not result in their inadequacy. In concluding the report, I have much pleasure in saying, that the neatness, accuracy and despatch with which the drawings are being executed, evince the professional skill of Mr. Geo. O. Driscoll, by whom I was assisted throughout the arduous and laborious duties of the field with unremitting assiduity; and successively by Lieutenants S. T. Gillet and D. McDougal, with indefatigable zeal, efficiency and fidelity.

Respectfully submitted, by Sir,

Your obedient servant,

EDWIN SCHENCK.

INDIANAPOLIS, December 11th, 1835

Sir—

Your instructions to me as Engineer in charge, dated, Evansville, May 19th, 1835, directing me to make examinations and surveys with a view to ascertain the practicability and probable cost of constructing a rail way from Evansville to Vincennes, and thence to Terre-Haute, have been complied with, and I have now the honor to present the following

## REPORT.

The geography of the country, when regarded with reference to the contemplated work, clearly indicates the general direction in which the construction of a rail way would probably encounter the fewest natural impediments.

The whole distance from Evansville to Vincennes by the line run, is 61.15 miles, which for convenience of reference is divided into three parts or divisions.

The first, or Southern Division, comprises that part of the route which extends from the northern boundary of the town of Evansville to Princeton, a distance of 31.6 miles. The Second Division includes the interval from Princeton to the north bank of White river, 12.3 miles in length. The third or Northern Division embraces the remainder of the route to Vincennes, a distance of 17.2 miles.

### FIRST DIVISION:

*From Evansville to Princeton—Length 31.6 Miles.*

Big Pigeon creek, which discharges its waters into the Ohio near the town of Evansville, rises near Princeton, and after pursuing a southerly course for about twenty miles, turns to the west, passes north of Evansville about three miles, when it again changes its course to the south, and enters the Ohio about one mile below the town. This stream is transverse to the direction of the road, and will have to be crossed. The situation of Evansville plainly denotes that it will de-



pend upon advantitious circumstances as to what course the road should pursue to cross Big Pigeon. The principal of these as it relates to the construction, are the selection of a proper point for crossing, and the direction which it would be necessary to take after the site for the bridge has been chosen. The line crosses near Negley's mill, upon a solid rock foundation, and is the best, and indeed the only point which such a structure could be erected.

Commencing then at the northern boundary of the town, the line without encountering any obstacle worthy of notice, is continued straight over level ground heavily timbered, to the point above mentioned. After crossing, the valley of Little Pigeon creek is pursued in order to attain sufficient elevation to pass over the lowest part of the ridge, separating its waters from that of Big creek and its tributaries flowing into the Wabash. The line as far as Little Pigeon was found to be favorable, but upon following up the east fork which was the first valley pursued, it was ascertained that although the ridge might be attained in a shorter distance, a cut averaging 27 feet about a mile, would be necessary to come within the maximum grade of 30 feet to the mile. It was therefore abandoned, and the line pursues the West fork of Little Pigeon to the summit at Hornbrook's over ground requiring comparatively but little excavation. This summit is the lowest point in the ridge, and is easily overcome with a grade of 30 feet to the mile for two miles. As another means for attaining the summit, an examination was made of the valley of the Muddy Branch, a tributary of Big Pigeon, separated from Little Pigeon by a high ridge, upon which the state road to Princeton is located. But it was discovered that in addition to the difficulties to be encountered in ascending to its head, which is 86 feet above grade at a point only two miles from its confluence with Big Pigeon, there would be continued and expensive side hill cutting and successive obstacles to reach the lowest point of the ridge above alluded to.

Another route was suggested through the valley of Locust creek, also a tributary of Big Pigeon, and lying still farther west. But the same difficulties present themselves here as were found to exist upon the East fork of Little Pigeon.

Soon after passing the summit we pass a small branch of Big creek, and ascend a small ridge dividing this branch of Big creek from the Big pond, (the spring head of the Pond Fork of Big creek) whence we are constrained to descend with a grade of 30 feet to the mile for one and a half miles to the eastern end of the pond. The line then crosses the pond, which is there about 3900 feet wide, and subject to inundation of from 1½ to two feet, requiring embankment to raise the road above the influence of the spring freshets. The trace of the line is then continued up the valley of Rush creek (a tributary of the pond) to its head, which is the most advantageous in direction for crossing the ridge between the pond and the Hurricane Fork of Pigeon; continuing along the course of the latter to its junction with the Barren Fork of Pigeon, the state road and the latter stream are crossed, and the line strikes the valley of the main, or as it is generally termed, Muddy Fork

When two surfaces are in contact, a certain force is necessary to cause them to slide upon one another: the property of a body to resist this sliding motion, is called adhesion, the amount of which a locomotive engine can spare to its load, above that required to propel itself forward, is inversely as the height of the plane is to its length. If the elevation of the plane on which the engine is to travel, equals 1-20 of its length; the whole adhesive power of the engine will be required to ensure to itself a progressive motion, notwithstanding the late experiments on the Baltimore and Ohio Rail Road, by which an engine was made to ascend an elevation from 35 or 40 to 260 feet per mile, effected simply by increasing the weight of the engine and its consequent adhesion to the rail.

In the event of the construction of the Madison, Indianapolis, and Lafayette Rail Road—and it be considered expedient, eventually, to have the depot at Madison, in order to overcome the elevation of the summit, it may be necessary to resort to stationary power; which, whether it be animal or mechanical, can at any time be duly proportioned to the demands of trade: that the steam engines may be of suitable capacity, and the amount of capital to be invested in them not unnecessarily enlarged, their erection might be temporarily deferred, and the transportation meanwhile across the plane be effected by the use of horses, until the imperative demands of trade require the substitution of stationary steam engines.

The machinery of an inclined plane is quite simple, indeed, independent of the stationary power; it may be said to consist merely of sheeves or rollers (made of cast iron) placed in the middle of the road-track, to sustain the rope or chain to which the cars are attached, while the graduation of the road-bed for the reception of the rails differs only in the slope or inclination which it may be required to assume, and the operation of the engine throughout the length of the plane is so obvious that it is scarcely necessary to say, that by means of a rope or chain, one end of which being attached to a train of cars, and the other passing around a sheeve wheel or drum around which the rope is wound by the action of the engine with a speed proportionate to its power. A part of this power is of course expended in overcoming the gravity of the load, and just so far as this may be the case, is the cost of transportation increased beyond what it would be on a level road: this cost may be partially diminished by attaching the end of the rope after passing around a horizontal sheeve wheel, to a train of weight cars (or wagons loaded with stone and kept for this purpose) which move in a opposite direction upon a parallel second track on the plane. On an inclined plane, the power acts parallel to the plane; hence the length of the plane is to the load as the elevation of the plane is to the requisite power.

Inclined planes with stationary power are successfully resorted to in our country. On the the Mohawk and Hudson Rail Road—Baltimore and Ohio Rail Road—Alleghany Portage Rail Road—the length of the latter is 36½ miles, on which are ten inclined planes; and in the first ten miles ascend 1399 feet. But this mode of conveyance is yet

more extensively resorted to in Great Britain, from a level to far greater inclinations than would be required in this case. In the rugged and mountainous country of South Wales, at a slope exceeding 10 deg., or an elevation of 931 feet per mile: and in one instance, they have a succession of planes, the slopes of which are from 15 to 20 deg., and the trade is as uninterruptedly conducted as upon a level road.

In the estimated cost submitted, is included that of requisite engines and machinery for the passage of an inclined plane.

## CONSTRUCTION OF THE RAIL WAY.

A great extent of the road-bed would not, for a long time after its graduation, be suitable to so expensive a system of foundations as stone sills or blocks embedded on rubble, were the question settled as to its decided preference.

Wooden sleepers transverse, and white oak logs underneath (lengthwise of the road to prevent the unequal and partial settling of the earth), being less liable to derangement than stone blocks, or sills on rubble, would, in my estimation, be better adapted to the country—postponing a more expensive and permanent structure to the construction of a second track, if deemed requisite by the amount of traffic, when the embankments shall have become consolidated, the cost of which would be materially reduced by the use of the rail way in transporting the necessary materials.

I shall present estimates of three different forms of superstructure, equally effective in character, but differing materially in first cost and durability.

1. The wrought iron flat rail, 24 inches in width by 5-8 inches in thickness, on wooden string pieces.

2. The edge rail having a continuous flat base, 3½ inches wide, resting upon scantling 6 by 8 inches square, of locust, pine, or oak: the rail 2 inches high, and weighing 32 pounds to the yard.

3. The most approved edge rail of the H form and of uniform depth, dispensing with the necessity of cast iron chairs, as arranged by Major McNeile, Chief Engineer of the Boston Rail Roads: which, besides its more obvious advantages, presents a cleaner way, and permits a more perfect drainage of the road bed, being less liable to obstructions from ice and snow: but whether it possesses advantages over the flat rail, in the present instance equal to the difference of cost may be deemed worthy of consideration. The usual foundations, whether for support of stone blocks, continuous sills, or wooden sleepers, are as readily secured from derangement by frost or other causes, and, indeed, are the same, whether the rails be wood or iron: the edge rail is therefore as applicable to the green state of the road bed as the flat rail on wooden strings.



The estimate of the flat rail delivered on the road, will be as follows:

Cost in Liverpool, per ton	\$31 10
Freight to New Orleans	2 50
Exchange, insurance, and commission, $13\frac{1}{2}$ per cent.	4 20
Shipping charges, inland transportation	11 20

Total cost per ton	\$49 00
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The estimate of the edge rail delivered on the road will be,

Cost in Liverpool, per ton,	\$40 00
Freight	2 50
Exchange, insurance, &c., $13\frac{1}{2}$ per cent.	5 40
Shipping charges, &c. &c.	11 20

Total cost per ton	\$59 10
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Estimate for one mile of Rail Way, single track, with flat rail:

22 tons flat rail, 24 by 5-8 inches, at \$49	\$1,078 00
782 lbs. iron spikes, at 9 cts., for confining rails to string pieces	70 38
713 lbs. splicing plates, at 9 cts., to be placed under ends of rails	64 17
31,680 feet of oak or pine string pieces, 6 by 8, at \$26 per M. feet	823 68
1,760 sleepers of oak or black locust, every 3 feet, at 25 c.	440 00
10,560 feet longitudinal sleepers or bearing timber, at 3 c.	316 80
1,040 yards of excavation for " " at 10 c.	104 00
Dressing and notching sleepers, at 10 c.	176 00
Laying sleepers and strings, at 15 c.	264 00
Wooden wedges to confine the string pieces, 3520, at 2 c.	70 40
Laying rails and fitting splicing plates under joints, at 2 c. per yard	35 20
Horse tread of gravel	300 00

Total cost	\$3742 63
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Estimate for one mile of Rail Way, single track, edge rail on scantling:

50 tons edge rail, at \$59 10	\$2,955 00
480 lbs. spikes, at 8 c.	38 40
String pieces	823 68
Transverse sleepers	440 00
Longitudinal sleepers	316 80
Excavation for " "	104 00
Dressing and notching sleepers	176 00
Laying sleepers and strings	264 00
Wedges	70 40
Laying rails	35 20
Horse tread of gravel	300 00

Total	\$5,523 48
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Estimate for one mile of Rail Way, single track, with approved edge rail:

55 tons edge rail, at \$59 10	-	-	-	-	\$3,250 50
640 lbs. spikes at 8 c.	-	-	-	-	51 20
1,760 sleepers at 25 c.	-	-	-	-	440 00
10,500 feet longitudinal sleepers, at 3 c.	-	-	-	-	316 80
1,040 yards of excavation for "	-	-	-	-	104 00
Dressing, notching, and laying sleepers	-	-	-	-	362 00
Laying rails	-	-	-	-	176 00
Horse tread of gravel	-	-	-	-	300 00

Total - - - - - \$5000 50

From these estimates, the cost will be with the flat rail, 146

miles, at \$3,742 63 dollars per mile	-	-	-	-	\$546,423 98
For 3½ miles of turn-outs	-	-	-	-	13,099 21

\$559,523 19

For the edge rail on scantling 146 miles, at \$5,523 48  
per mile

-	-	-	-	-	806,428 08
For 3½ miles of turn-outs	-	-	-	-	19,332 18

\$825,760 26

For the most approved form of edge rail, 146 miles, at

\$5000 50 per mile	-	-	-	-	730,073 00
For 3½ miles of turn cuts	-	-	-	-	17,501 75

\$747,574 75

When it shall be deemed advisable to pass the inclined plane by means of stationary steam engines, their cost, with that of the requisite fixtures and machinery, such as engine house, ropes, drums, and sheeves, will be

\$6,975 00

From the foregoing estimates, the aggregate cost of a Rail Road, from Madison direct to Indianapolis and Lafayette, if constructed with the flat rail, will be, agreeably to the following

### SUMMARY.

For formation of road bed	-	-	-	-	\$948,772 58
Rail Way and turn-outs	-	-	-	-	559,523 19
Contingencies ten per cent.	-	-	-	-	150,829 58
Stationary Steam Engine and fixtures	-	-	-	-	6,975 00

1,666,100 35

If constructed with the most approved edge rail, the estimate for rail way and turn-outs will be \$747,574 75, which if substituted in place of the corresponding item in the summary gives for the aggregate cost \$1,854,151 91; these sums divided by the distance we have \$11,411 64 per mile with the flat rail and \$12,700 00 per mile with the most approved edge rail.

Should it be deemed expedient in the incipency of the operations of the work to construct the rail way on rubble or broken stone (instead of logs underneath and lengthwise of the road) as practised on numerous rail roads now in operation in our country, the second item of the above summary would be enhanced 1380 dollars per mile.

If the depot is established on the summit at Madison, the aggregate cost with the flat rail will be agreeably to the following

#### S U M M A R Y:

Formation of road bed	-	-	-	913,567 00
Rail way and turn-outs	-	-	-	553,909 25
Contingencies ten per cent	-	-	-	146,747 62

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\$1,614,223 87

If constructed with the approved edge rail, the estimate for rail way and turn outs will be \$740,074 00, which would increase the aggregate cost to \$1,800,388 62. These sums divided by the distance, 144½ miles, we have \$11,171 10 per mile with the flat rail, and \$12,459 43 per mile with the edge rail.

From Indianapolis to Danville, Crawfordsville, and Lafayette, the cost of a rail road with the flat rail, will be agreeably to the following

#### S U M M A R Y.

For formation of road bed	-	-	-	859,417 00
Rail way	-	-	-	277,890 28
Turn-outs one and a half miles	-	-	-	5,613 94
Contingencies ten per cent	-	-	-	114,292 12

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\$1,257,213 34

If constructed with the approved edge rail, the estimate for rail way and turn-outs, will be \$378,787 87, which would increase the aggregate cost to \$1,352,496 99. These sums divided by the distance, 74½ miles, we have \$16,932 16 per mile with the flat rail, and \$18,215 44 per mile with the edge rail.

**WIDTH OF THE ROAD.**—A graduated surface from thirteen to fifteen feet in width, occasionally increased a few feet to admit of passing places, would afford ample space for one track: but a rail road designed to accommodate a general trade, should be graduated for a double set of tracks, notwithstanding the trade may be managed with but little interruption on one track with occasional turn-outs—the consolidation of the surface for a second track when it shall be required, and the necessity of using more costly and less perishable material in the first instance; from the interruption which must otherwise ensue in renewing a single track, more than outweigh the increased cost of a graduation for two tracks, which is not enhanced in proportion to the width. Time will not permit a precise calculation of the difference of cost by the diminished width of road bed and consequent reduction of excavation and embankment; but it may be safely estimated in the present instance at 23 per cent. The total length of the proposed rail road from Madison to Indianapolis, is 85½ miles, the total ascents and

descents 1534.6 feet; the average rate of ascent from Madison is 10.2 feet per mile, and deducting the elevation of the inclined plane, is 6.23 feet per mile. The effect of gravity upon this inclination is 2.64 lbs. per ton. From Indianapolis, the average ascent is 3.76 feet per mile, and the effect of gravity is 1.60 lbs.—hence the average power required to move one ton to Indianapolis, is 10.37 lbs., and to Madison 8.29 lbs. The greatest power required either way is 22.06 pounds per ton: by varying the velocity with the power necessary to move upon the different inclinations of the road, a locomotive engine weighing but 4½ tons, may draw at a rate averaging

6 miles per hour	-	-	-	-	36 tons
15 “ “	-	-	-	-	15 “
20 “ “	-	-	-	-	10 “

and a horse may draw up the greatest elevation at

5 miles per hour	-	-	-	-	3½ tons
10 miles per hour	-	-	-	-	2 tons*

The estimated price for the formation of road bed varies from ten to twenty-three cents per cubic yard, and is based upon the details of the several excavations and embankments, which have respectively equal and two-third slopes, with a view as well to the supposed degree of tenacity of the materials to be excavated, as the distance to be hauled; the cost of which may be materially reduced, if the use of temporary rail ways be resorted to, as is frequently the case, for the removal of earth and other materials into the embankment.

Dry masonry, viz: without the use of mortar, is generally contemplated. The stones being dressed to a fair and equable bearing, and laid with a single view to strength and solidity: under these circumstances, the assumed cost of the masonry varies from 2 to 6.50 dollars per perch, in proportion to the character of the structure and proximity of suitable building stone.

For the passage of established water courses, the estimate provides for efficient wooden bridges, the floors of which would form a roof impervious to the water and securely protect the timbers beneath from the weather. The assumed average cost of grubbing and clearing is \$550 40 per mile. There are no objectionable curvatures on the route, as with but few exceptions, it is virtually straight.

The present line of survey from Madison to Lafayette may be considered as merely experimental, and instituted with a view to ascertain the practicability of a rail road, rather than approximate the definite location. The result proves conclusively the feasibility of the contemplated rail road, both as regards the planes of inclination, admitting almost throughout the entire route, an economical use of locomotive power, and the comparatively moderate cost at which this desirable object may be attained.

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\* Mr. Wood states, that 32 horses on a rail road, would do the work of 240 horses on a common turnpike road: or a locomotive engine on a rail way, travelling at the respective rates of 10 and 15 miles per hour, will perform the work of 240 horses on a turnpike road.



The estimates amply provide for contingencies, the occurrence of which, I feel assured, will not result in their inadequacy. In concluding the report, I have much pleasure in saying, that the neatness, accuracy and despatch with which the drawings are being executed, evince the professional skill of Mr. Geo. O. Driscoll, by whom I was assisted throughout the arduous and laborious duties of the field with unremitting assiduity; and successively by Lieutenants S. T. Gillet and D. McDougal, with indefatigable zeal, efficiency and fidelity.

Respectfully submitted, by Sir,

Your obedient servant,

EDWIN SCHENCK.

INDIANAPOLIS, December 11th, 1835

Sir—

Your instructions to me as Engineer in charge, dated, Evansville, May 19th, 1835, directing me to make examinations and surveys with a view to ascertain the practicability and probable cost of constructing a rail way from Evansville to Vincennes, and thence to Terre-Haute, have been complied with, and I have now the honor to present the following

### REPORT.

The geography of the country, when regarded with reference to the contemplated work, clearly indicates the general direction in which the construction of a rail way would probably encounter the fewest natural impediments.

The whole distance from Evansville to Vincennes by the line run, is 61.15 miles, which for convenience of reference is divided into three parts or divisions.

The first, or Southern Division, comprises that part of the route which extends from the northern boundary of the town of Evansville to Princeton, a distance of 31.6 miles. The Second Division includes the interval from Princeton to the north bank of White river, 12.3 miles in length. The third or Northern Division embraces the remainder of the route to Vincennes, a distance of 17.2 miles.

### FIRST DIVISION:

*From Evansville to Princeton—Length 31.6 Miles.*

Big Pigeon creek, which discharges its waters into the Ohio near the town of Evansville, rises near Princeton, and after pursuing a southerly course for about twenty miles, turns to the west, passes north of Evansville about three miles, when it again changes its course to the south, and enters the Ohio about one mile below the town. This stream is transverse to the direction of the road, and will have to be crossed. The situation of Evansville plainly denotes that it will de-



pend upon adventitious circumstances as to what course the road should pursue to cross Big Pigeon. The principal of these as it relates to the construction, are the selection of a proper point for crossing, and the direction which it would be necessary to take after the site for the bridge has been chosen. The line crosses near Negley's mill, upon a solid rock foundation, and is the best, and indeed the only point which such a structure could be erected.

Commencing then at the northern boundary of the town, the line without encountering any obstacle worthy of notice, is continued straight over level ground heavily timbered, to the point above mentioned. After crossing, the valley of Little Pigeon creek is pursued in order to attain sufficient elevation to pass over the lowest part of the ridge, separating its waters from that of Big creek and its tributaries flowing into the Wabash. The line as far as Little Pigeon was found to be favorable, but upon following up the east fork which was the first valley pursued, it was ascertained that although the ridge might be attained in a shorter distance, a cut averaging 27 feet about a mile, would be necessary to come within the maximum grade of 30 feet to the mile. It was therefore abandoned, and the line pursues the West fork of Little Pigeon to the summit at Hornbrook's over ground requiring comparatively but little excavation. This summit is the lowest point in the ridge, and is easily overcome with a grade of 30 feet to the mile for two miles. As another means for attaining the summit, an examination was made of the valley of the Muddy Branch, a tributary of Big Pigeon, separated from Little Pigeon by a high ridge, upon which the state road to Princeton is located. But it was discovered that in addition to the difficulties to be encountered in ascending to its head, which is 86 feet above grade at a point only two miles from its confluence with Big Pigeon, there would be continued and expensive side hill cutting and successive obstacles to reach the lowest point of the ridge above alluded to.

Another route was suggested through the valley of Locust creek, also a tributary of Big Pigeon, and lying still farther west. But the same difficulties present themselves here as were found to exist upon the East fork of Little Pigeon.

Soon after passing the summit we pass a small branch of Big creek, and ascend a small ridge dividing this branch of Big creek from the Big pond, (the spring head of the Pond Fork of Big creek) whence we are constrained to descend with a grade of 30 feet to the mile for one and a half miles to the eastern end of the pond. The line then crosses the pond, which is there about 3900 feet wide, and subject to inundation of from 14 to two feet, requiring embankment to raise the road above the influence of the spring freshets. The trace of the line is then continued up the valley of Rush creek (a tributary of the pond) to its head, which is the most advantageous in direction for crossing the ridge between the pond and the Hurricane Fork of Pigeon; continuing along the course of the latter to its junction with the Barren Fork of Pigeon, the state road and the latter stream are crossed, and the line strikes the valley of the main, or as it is generally termed, Muddy Fork

of Pigeon. After some examination we selected this latter branch as evidently the best route in preference to the valley of Clear Fork on the east side of the State Road Ridge.

In the neighborhood of the junction of these streams, the bottoms spread out to perhaps a mile in width, and will admit of a line rather shorter than that run. The line of survey then diverges to the west to take advantage of this creek, and thence running north, traverses a small elevation, the drains from which supply Log Pond, a large collection of water extending several miles north and south, and which is said to be not only the source of Muddy fork of Pigeon creek, but also a tributary of Patoka. Touching the eastern edge of this pond, we gradually attain the high ground dividing its tributaries from those of the Clear Fork of Pigeon; making a small cut across the ridge, the face of it is pursued to a point 14 miles south of Princeton, with easy grades—thence across a low ridge and down a ravine into the valley of Richland creek, (a tributary of Patoka) to Princeton. The line then passes through the western part of the town. The country between Evansville and Princeton, generally affords good timber; limestone rock is found on Big Pigeon in the immediate vicinity of the line, and sand stone rock was also discovered in the bed of the creek by which the line ascends from the Big Pond. Upon other parts of the route, stone is scarce, and will generally have to be hauled a considerable distance, which will much enhance the cost of masonry upon this division. The whole estimated cost of graduation and masonry from Evansville to Princeton, amounts to \$94,402 06, the details of which are attached.

## SECOND DIVISION:

*From Princeton to the North Bank of White River, 12.53 Miles.*

Three lines were run from Princeton with a view of ascertaining the best mode of descending to the Patoka river, the ground presenting a surface broken by streams flowing northwesterly into the Patoka. Of these, the last one run, is considered the most favorable, and passes through the western edge of the town.

In consequence of the difference of elevation between Princeton and Patoka, it became necessary to commence a descent before reaching Princeton; therefore on leaving the town we are forced to make a small cut across the ridge upon which the body of the town is built, and which divides Richland creek from another small creek tributary to Patoka, but discharging by too circuitous a route for its valley to be pursued by our line. Consequently we cross over a low flat ridge into the valley of another creek which crosses the state road from Princeton to Vincennes, about two miles from Princeton—thence the valley of the creek is followed in a northwesterly direction to the valley of Patoka.

The valley of Patoka is of considerable width where we enter it, bounded by a high and broken country, and subject to inundation when there is a simultaneous rise of the Patoka and Wabash rivers. The line crosses the Patoka below the Columbia Mills, passes over a

bottom land extending from Patoka to White river, the surface of which is somewhat broken, and elevated apparently by a sandy deposit washed from the hills which skirt it on the east. We then follow up the valley of White river for nearly four miles, to the mouth of Robb's mill creek, near Hazleton's ferry over alluvial bottom land heavily timbered and subject to inundation involving the necessity of heavy embankments over considerable portions of this part of the route.

A long and expensive bridge will be required to pass the road over White river, being subject to the influence of freshets. The work will have to be constructed in the very best manner to enable it to withstand the shocks of the floating ice and timber, which are brought down in immense quantities. A wooden superstructure is estimated for with four arches of 150 feet span each, resting upon three stone piers, which are 43 feet high. The versed line of the arch will be ten feet above high water mark so as to allow the free passage of flat boats descending the river. An estimate of the cost of this bridge is included in the details of this Division annexed. In consequence of the heavy embankments necessary in passing over the bottom of White river to the crossing, it was deemed expedient to examine another route to ascertain if the approach to it could not be effected without incurring the heavy expense which would be necessary upon the route surveyed. With this view a reconnoissance was made of the proposed route from a point in our line about three miles north of Princeton, ascending the valley of a small creek flowing south, to its head, crossing a ridge, and descending by means of a ravine to the valley of the Patoka, near the bridge on the state road from Princeton to Vincennes. The descent of the ravine was considered to be too great when compared with its length, being not more than half a mile, and would have required a cut through its summit so great, and an embankment across the valley of Patoka so heavy as to form an objection of itself almost sufficient to condemn the route.

From the bridge the country in the vicinity of the state road was examined as far as the head of Robb's mill creek, with a view of descending that stream to the crossing of White river, but the extreme ruggedness of the country would have required very expensive excavations and embankments, which together with the objection already stated, decidedly gave the preference to the route surveyed. The whole estimated cost of graduation and masonry upon this division, amounts to \$123,425 11, the details of which are attached.

### *THIRD, OR NORTHERN DIVISION,*

*From White river to Vincennes—Distance 16.97 Miles.*

After crossing White river, the line pursues its valley through rich bottom lands, subject to overflow up to Decker's Station, to Vincennes, the character of the country is somewhat diversified. On the east, low rolling barrens commence and continue to within four miles of White river when the country becomes high and undulatory, and ex-



tending east for a considerable distance. West of these barrens a different aspect is presented, the land being generally low and swampy, subject to inundation both by White river and the Wabash. The country as it approaches Vincennes, gradually changes into wet prairies, interspersed occasionally with low timbered land. After leaving Decker's Station, the line skirts the western edge of the Barrens, and crosses the river Deschee near the state road and avoiding the high grounds on the right, enters the state road at Bushy prairie, the general course of which it maintains to Vincennes. The grades upon this division are very easy, and the graduation comparatively cheap.

The whole cost of this division amounts to \$37,852 26, the details of which are attached. Making the whole cost for graduation, masonry &c. from Evansville to Vincennes amount to \$255,679 43

### VINCENNES AND TERRE-HAUTE RAIL ROAD.

This line like the preceding, is divided into three divisions, viz:—The first division extending from Vincennes to Maria creek: the second division extending from Maria creek to Terman's creek; and the third division extending from Terman's creek to the termination of the line at Terre-Haute.

#### FIRST DIVISION.

The first division, extending from Vincennes to Maria creek, is 8 miles and 896 yards in length. The line from Vincennes pursues the prairie upon which the town is built, as far as Snap's creek, over ground in places subject to overflow: crossing Snap's creek and a low flat ridge which divides it from Mill creek, the line crosses the latter and follows along the face of the high bluffs of the Wabash river above the influence of freshets, passing the site of Fort Knox, to Small's creek, a tributary of Maria creek. After crossing Small's creek the line encounters a high rocky bluff of sand stone, which will render the construction of that part of the road somewhat expensive. The bluff is perpendicular for the most part, and extends about one and a half miles to the termination of the division. The road will be obliged to occupy the low bottom of the Wabash immediately at the base of the bluff, which will require heavy embankments to protect it from the influence of the freshets. Earth for this purpose however, can be obtained from the bluff in the immediate vicinity.

It may be necessary in some instances, further to guard against the high water by a protection wall—stone for which is on the spot.

The grades upon this division are all easy. The whole estimated cost of graduation upon this division, amounts to \$32,756 09—the details of which are annexed.



## SECOND DIVISION.

*The Second Division embracing the country from Maria to Terman's creek, is 30 miles and 1,333 yards in length.*

Maria creek will require a bridge of 100 feet span, and an embankment of  $17\frac{1}{2}$  feet high across its bottom to give sufficient space under the bridge for the passage of flat-boats descending the creek. In consequence of the scarcity of stone, the structure will be necessarily expensive.

From the crossing of Maria creek, the line skirts the eastern edge of Busserow prairie, taking advantage of a slight elevation or ridge above high water mark for about four miles, when it enters the prairie and continues in it its whole length to within a mile and a half of Busserow creek, when it passes through wood-land over slightly undulating ground to the creek, which is crossed at Snap's, near the old State Road to Merom. This stream will require a bridge of 100 feet span, and a heavy embankment averaging fifteen feet for a quarter of a mile.

From Busserow to Sugar creek the line follows a low flat ridge, dividing the waters flowing into Busserow and Buck creeks on the east from those flowing into the Wabash and Turtle creek on the west. The first four miles is over a sandy barren, thence over a wet prairie extending nearly to Lebanon: it there passes through the eastern edge of the town and enters a flat beech woods which continues to Sugar creek.

From Sugar creek the line crosses the ridge dividing it from Terman's creek, passing through an arm of Currey's prairie. From the summit of the ridge the line follows down a ravine putting into Terman's creek. A long heavy embankment will be required to pass the valley of the creek averaging 18 feet for a quarter of a mile, together with a bridge of 100 feet span.

The heaviest grades in this division do not exceed 30 feet to the mile, and are no where necessary for more than  $\frac{1}{4}$  of a mile; the ascents and descents for the most part being long and gradual.

The whole estimated cost of this division amounts to \$105,778 51: The details of which are annexed.

## THIRD DIVISION.

*The Third Division comprising the country between Terman's creek and Terre-Haute is 18 miles and 1,120 yards in length.*

Immediately after crossing Terman's creek the line ascends a low flat ridge dividing the main stream on the east from one of its tributaries on the west, and following the ridge rather on the west face for about six miles descends to the level of the Honey creek prairie, crosses Prairie creek, passes the high ground on the east, occasionally encountering low swampy ground, subject, in many places, to inundation, and then passes through an arm of Honey creek prairie, crosses Honey

creek near the road from Carlisle to Terre-Haute, when it enters Fort Harrison prairie and continues in it until within a short distance of Terre-Haute, when passing through a narrow piece of wood-land, it is terminated at the southern boundary of the town.

The grades upon the whole of the division are remarkably easy, and the cost of graduation will be moderate. The whole cost of graduation and masonry amounts to \$67,360 11.

According to the instructions received from you, the following plan of superstructure has been estimated for:

Two trenches will be excavated the whole length of road parallel to each other, corresponding to each line of rail, 2 feet wide and 18 inches deep, into which will be placed bearing timbers 12 inches square. On these bearing timbers will be laid black locust cross-sills or sleepers, 6 by 8 inches, 7½ feet in length and 3 feet apart from centre to centre, into which will be cut the notches to receive the side rails of Susquehanna pine 6 by 6 inches, secured to their proper places by wedges on the inside. On the inner edge of the side rails will be laid flat bars of iron, 2½ inches in width by 5-8 inches in thickness, and properly fastened to the side rails by screw bolts and iron spikes.

Cost per mile of a single track of flat bar Rail Way:

22 tons iron rails, 24 x 5-8, \$49 per ton.	-	-	1,078 00
Splicing plates and screw-bolts, 782 lbs. at	9 c.		70 38
Iron spikes 713 " at	9 c.		64 17
Susquehanna rail scantling, 6 by 6, 31,680 feet,	26 c.		823 68
1,760 black locust sleepers,	25 c.		440 00
Bearing timbers under sleepers, 10,560	3 c.		316 80
Excavating trenches for do. 1,040 cubic yards,	10 c.		104 00
Dressing and notching sleepers,	10 c.		176 00
Laying sleepers and string pieces	15 c.		264 00
3,520 wooden wedges,	2 c.		70 40
Fitting plates under joint and laying rail,	2 c. per yd		35 20
Horse	-	-	300 00

\$3,742 63

*From Evansville to Vincennes.*

Total cost of road bed from Evansville to Vincennes, distance of 61.15 miles	-	-	255,679 43
Average cost of road bed, per mile	-	-	4,181 18
To which add the cost of superstructure of one mile in the proposed plan	-	-	3,742 63
Total cost per mile	-	-	<u>7,923 81</u>

Or for 61.15 miles of Rail Road	-	-	-	484,541	25
To which add for turn-outs	-	-	-	3,924	00
				<hr/>	
				\$488,465	25
For contingencies, pay of superintendants, engineers, &c., add 10 per cent.	-	-	-	48,846	52
				<hr/>	
				\$537,311	77
Making the average cost per mile, including turn-outs every five miles	-	-	-	<hr/>	
				\$8,786	77
				<hr/>	

*From Vincennes to Terre-Haute.*

Total cost of road bed from Vincennes to Terre-Haute, distance of 57.9545 miles	-	-	-	205,894	71
Average cost of road bed per mile	-	-	-	3,552	69
To which add the cost of superstructure for one mile				3,742	63
				<hr/>	
Total cost per mile	-	-	-	\$7,295	32
Or, for 57.9545 miles of Rail Road	-	-	-	422,796	96
To which add for turn-outs	-	-	-	3,924	00
				<hr/>	
				426,720	96
For contingencies, &c., add 10 per cent.	-	-	-	42,672	09
				<hr/>	
Making total cost of Rail Road	-	-	-	\$469,393	05
Making the average cost per mile, including a turn-out every five miles	-	-	-	<hr/>	
				\$8,099	63
				<hr/>	

*From Evansville to Terre-Haute.*

Total cost of road bed from Evansville to Terre-Haute, a distance of 119.1045 miles	-	-	-	461,574	14
Total cost of superstructure	-	-	-	445,764	07
To which add for turn-outs, one in five miles	-			7,848	00
				<hr/>	
				915,186	21
For contingencies, &c., add 10 per cent.	-	-		91,518	62
				<hr/>	
				\$1,006,704	83
Making the average cost per mile, from Evansville to Terre-Haute	-	-	-	<hr/>	
				\$8,452	28
				<hr/>	

I have thought it proper to mention the grade only on those parts of the line where it might be apprehended that a good one could not be obtained. With these exceptions, the ground on the whole distance of the line is not too undulating to admit of a considerable less grade than 30 feet to a mile. In the cases in which this maximum has to be ap-

plied, the distance is too short to have any considerable effect in the retardation of the speed of the cars.

It is incumbent on me to tender an expression of my thanks to Gen'l. Evans, Capt. Martin, Col. Boon, Capt. Watson, and other commissioners on the line, for their attentions during the survey, which tended to facilitate its progress.

Respectfully submitted,

JAMES W. COLLINS,  
*Civil Engineer.*



# EVANSVILLE AND VINCENNES RAIL ROAD—First Division, from Evansville to Princeton.

EXCAVATION. Cubic Yards.			EMBANKMENT— Cubic Yards.			GRUBBING & CLEARING in Chains of 50 ft.			MASONRY in Perches of 25 cub. ft.			WOODEN BRIDGES in Lineal Feet.			Total Cost.
No. Yds	Price	Amount.	No. Yds.	Price.	Amount.	No. Chs.	Price.	Amount.	No. Per.	Price.	Amount.	No. of ft.	Price.	Amount.	
2,450	\$11	\$269 50	32,781	\$12½	\$4,097 63										
			5,400	14½	796 50										
			2,971	16	475 36										
			5,163	14	722 82										
			8,938	18	1,608 84										
			1,511	16	241 76										
			2,575	14½	379 81										
			2,307	14	322 98										
			1,866	13	242 58										
		269 50			8,888 28										
	11	822 03	60,050	12½	7,506 25										
			5,793	13½	767 57										
			1,133	13½	152 95										
			7,882	13	1,024 66										
			14,208	13½	1,918 08										
			336	14½	48 72										
		3560 70	98,213	12½	22,276 62										
32,370	11		22,230	14	3,112 20										
			14,124	14½	2,012 67										
12,908	11	1419 88	45,693	12½	5,711 62										
									1,614	\$4	\$6,456				

Big Pigeon . . .

16,800  
feet.

[illegible]

Average cost of Graduation for Division \$2,986 84

EVANSVILLE AND VINCENNES RAIL ROAD—Second Division, from Princeton to White River.

[illegible]

Average cost of graduation for Division \$9,849.58.

EVANSVILLE AND VINCENNES RAIL ROAD—Third Division, from White River to Vincennes.

EXCAVATION— Cubic Yards.			EMBANKMENT— Cubic Yards.			Grubbing & Clearing in chains of 50 feet.			MASONRY IN PERCH'S of 25 cubic feet.			WOODEN BRIDG'S in lineal feet.			Total cost.
No. of yds.	P.	Amount.	No. of yds.	Pr	Amount.	No. of ch'sns.	Pr.	Am'tnt.	No. of per.	Pr.	Am'tnt.	No. of offt.	Pr.	Am'tnt.	
367	10	86.70	18,953	12	2,274.96										
			23,224	16½	3,831.96										
			14,304	16	2,288.64										
			12,217	15	1,832.55										
10,984	10	1,098.40	63,713	11½	7,326.99										
10,501	10	1,050.10	62,766	11½	7,218.09										
			3,578	12	429.36										
3,188	10	318.80	12,641	11½	1,453.71	664	4.75	3,154	472	650	3,068	100	23	2,300	
													5	120	
								\$3,154	472		\$3,068	124			\$2,420
17-66	25,540	\$2,554.00	211,401		\$26,656.26	664		\$3,154	472		\$3,068	124			\$37,852.26

Average cost of graduation for Division

Average cost of graduation from Evansville to Vincennes

Total cost of graduation from Evansville to Vincennes 255,679.43

\$2,225.03

4,181.18

255,679.43



# VINCENNES AND TERRE-HAUTE RAIL ROAD—First Division, from Vincennes to Maria Creek.

EXCAVATION— Cubic Yards.			EMBANKMENT— Cubic Yards.			Grubbing & Clearing in chains of 50 ft.			MASONRY in perch's of 25 cub. ft.			WOODEN BRIDG'S in lineal feet.			Total Cost.
No of yds.	Pr.	Amount.	No. of yds.	Pr.	Amount.	No. of chn's.	Price	Am't.	No. of perch	Price	Amount.	No. of P. feet.	Am't.		
36,464	10	3,646.40	20,855	13½	2,815.42										
4,528	12	543.36	79,278	11½	9,116.97										
21,526	10½	2,260.23	23,080	16½	3,808.20										
10,838	10	1,083.80	2,167	12	260.04										
			1,856	16	296.96										
			2,154	11½	247.71	648	4.75	3078	806	6.50	5,239	72	5	360	
8-2960	73,356	\$7,533.79	129,390		\$16,545.30	648		\$3,078	806		\$5,239	72		\$360	\$32,756.09

Average cost of graduation for Division, \$3,826.64

# VINCENNES AND TERRE-HAUTE RAIL ROAD—Second Division—from Maria to Turman's.

EXCAVATION— Cubic Yards.			EMBANKMENT— Cubic Yards.			GRUBBING & CLEARING— in Chains of 50 feet.			MASONRY in per. of 25 cub. ft.			WOODEN BRIDGES in Lineal Feet.			TOTAL COST.
No. Yds.	Price.	Amount.	No. Yds.	Price.	Amount.	No. Chs.	Price	Amount.	No. of Perc's	Price.	Amount.	No. ft	Price.	Amount.	
7,585	11	\$834 35	53,018	11½	\$6,097 07										
30,011	10	3,001 10	15,326	11½	1,762 49										
26,699	10	2,669 90	42,540	16½	7,019 10										
26,443	10½	2,842 61	3,315	15½	513 82										
7,398	11	813 78	2,371	12½	296 37										
26,641	10	2,664 10	44,216	11½	5,084 84										
3,964	11	436 04	9,140	16½	1,485 25										
14,795	15	2,219 25	1,092	12½	133 77										
4,321	10½	453 70	11,410	14½	1,654 45										
38,257	10	3,825 70	40,678	11½	4,677 97				871 6	5,226					
18,395	12½	2,253 38	42,361	16½	6,989 56				1,007 6	6,042					
54,079	10	5,407 90	12,286	14½	1,750 75				382 6	2,292					
			4,144	13½	559 44				1,007 6	6,042		300	23	\$ 6,900	
			21,068	11½	2,422 82	1,424	\$4,75	\$6,764	758 6	4,548		19	5	95	
30-4000	258,588	27,421	81302,965		40,447 70	1,424		6,764	4,025	24,150		319		6,995	\$ 105,778 51

Average cost of graduation for Division \$2,986 84

VINCENNES AND TERRE-HAUTE RAIL ROAD—Third Division, from Turman's to Terre-Haute.

EXCAVATION— Cubic Yards.			EMBANKMENT— Cubic Yards.			GRUBBING & CLEARING in chains of 50 feet.			MASONRY in perches of 25 feet.			WOODEN BRIDGES in lineal feet.			Total Cost.
No. of yards.	Pr.	Amount.	No. of yards.	Pr.	Amount.	No. of chains.	Pr.	Amount.	No. of feet.	Pr.	Amount.	No. of feet.	Pr.	Am't.	
3,586	10 $\frac{3}{4}$	\$ 385.49	21,181	16	3,388.96										
11,006	13 $\frac{3}{4}$	1,513.32	3,069	12 $\frac{1}{2}$	375.95										
14,028	10	1,402.80	12,375	15 $\frac{1}{2}$	1,918.12										
3,792	11	417.12	23,095	11 $\frac{1}{2}$	2,655.92										
13,989	12 $\frac{1}{2}$	1,748.62	43,511	16 $\frac{1}{2}$	7,179.31										
36,498	10	3,649.80	4,741	12 $\frac{1}{2}$	592.62										
8,122	12	974.64	1,874	15 $\frac{1}{2}$	290.47										
5,037	13	654.81	26,035	11 $\frac{1}{2}$	2,994.02										
2,054	11	225.94	1,194	13	155.22				581	6.50	3,776.50				
11,026	14	1,543.64	10,688	11 $\frac{3}{4}$	1,255.84				110	6.50	715.00				
15,451	10	1,545.10	77,964	11 $\frac{1}{2}$	8,965.86				529	6.50	3,438.50	100	23	2,300	
1,669	10 $\frac{1}{2}$	175.24							571	6.50	3,711.50	43	5	215	
37,988	10	3,798.80				1,136	4.75	5,396							
18-3360	164,246	18,035.32	225,727		\$29,772.29	1,136		\$5,396.17	1,791		\$11,641.50	143		\$2,515	\$67,360.11

### Average cost of graduation for Division

\$3,614.52

Average cost of graduation from Vincennes to Terre-Haute 3,552.69

3,875.42

Total cost from Vincennes to Terre-Haute 205,894.71

461,574.14

Total cost from Evansville to Terre Haute

INDIANAPOLIS, September 30, 1835.

HOWARD STANSBURY, }  
U. S. Civil Engineer. }

Sir—

In compliance with your orders, dated Lawrenceburgh, May 4, 1835, I have prosecuted the surveys intrusted to me, and have the honor to submit to your consideration the following report and estimate of the cost of a Rail Road between Lawrenceburgh and Indianapolis, Indiana.

The few remarks I have to offer will be given under the following heads:

1. Character of the country between Lawrenceburgh and Indianapolis.
2. Details of the route surveyed.
3. Plan of construction, with the estimated cost of superstructure.
4. Cost of graduation.

## 1. CHARACTER OF THE COUNTRY.

After attaining the summit at an elevation of 550 feet above the Ohio river, the prevailing feature of the country is a flat table land, very much broken in the vicinity of the larger streams by the innumerable ravines and water courses which traverse and drain the country in all directions. From Lawrenceburgh, following the valley to the head of Tanner's creek, the ground is very broken, these ravines occurring at short intervals. From the head of Tanner's creek there are intervals of level land until we strike the dividing ridge between the tributaries of White Water river and the heads of Laughery and Sand creeks; these streams interlocking here very closely, the breaks of White Water river and Laughery creek, being frequently within a few yards of each other. This is the summit ridge of this section of the state, dividing the waters which flow into the Wabash, from those which follow the White Water into the Ohio river.

After leaving this ridge, the ground descends gently towards the west, and until we reach Greensburgh, is much broken by the drains and ravines of Sand creek. From Greensburgh to Flat Rock river, a distance of nine miles, the surface is generally flat, descending gradually towards this river; after leaving the valley of this river, the country descends gently to the Blue river valley at Shelbyville, between this and Buck creek, a distance of fourteen miles, the country is level; but from Buck creek to a point about eight miles from Indianapolis, the ground again rises gradually; descending again from this point in the direction of Indianapolis. The surface, however, except in the vicinity of the streams, is flat.

## GEOLOGICAL FEATURES.

In common with the whole basin of the Mississippi, the country is of a secondary formation, characterized by its extensive level plains, and



the gently undulating outline of its hills. This formation is covered by a deposition of alluvial, which, resulting mostly from the prevailing formation produces a rich soil independent of the mould deposited by the continual decomposition of vegetable matter.

The rock met with in the vicinity of the line, is the secondary limestone, varying both in color and structure from a dark blue to a light dun color, and from compact close-grained to an earthy or clayey structure. Much of this lime stone, particularly that near the surface, the stratum of which contains vast quantities of the remains of marine animals. In some situations, the stratum appearing on the surface is almost wholly composed of shells, and is used to advantage in the burning of lime. The best lime stone as a building stone, which occurs on the line, is at Flat Rock river; the upper strata being about six or eight inches in thickness, to form a good building stone. This stone is of a light dun color, the fracture exhibiting a glimmering lustre somewhat resembling the coarser marbles, and is very compact.

The formation of lime stone is intercepted in some places by tracks of sand stone. Near Sand creek a light yellow sand stone occurs. The grain is close, and if found in sufficient quantities would form a good building stone.

In the vicinity of Shelbyville, boulders of gneiss and granite appear on the surface, but not in sufficient quantities to be of any use. The only indication of metallic ore observed near the line, are upon Tanner's creek. Galena (sulphuret lead) has been found in small lumps, in or near the creek; but whether it was in situation, or had been washed from its proper place by the drainage of the country, was not apparent.

#### TIMBER.

The timber in the vicinity of the line is pretty much the same throughout, viz: sugar-maple, beech, poplar, walnut, white-oak, elm, and ash. The above order of arrangement will be very nearly in the proposition in which they occur. The white-oak is found mostly in groves, but is not as generally distributed over the country as the other species of timber.

## 2. DETAILS OF THE ROUTE SURVEYED.

In selecting a point from which to commence the experimental surveys, several circumstances were to be taken into consideration. Lawrenceburgh, situated in a low bottom of the Ohio river, is exposed to all the inconveniences attending a sudden rise of its waters. Through this bottom, open the several streams, Tanner's, Wilson, Hogan, and Laughery creeks, whose valleys offer a means of attaining by a gradual rise the elevated land in the interior. All of these streams, however, owing to the gradual rise of their beds, for the first four miles, are affected by the freshets of the Ohio river, the waters of which are in many instances, backed up six or seven miles from their mouths. Before deciding which stream to make use of, the most satisfactory course, perhaps, would have been to have made a detailed survey of each,

But this, time would not permit. A few remarks explaining the relative situation of each stream, will not be amiss in this place.

If Laughery creek had been taken, the line should pass above the reach of the high water of the Ohio river, over Tanner's, Wilson's, and Hogan's creeks, following the river bank until it meets the mouth of Laughery creek, a distance of six miles. If Hogan's creek had been taken, the same difficulty would have presented itself in the crossing of Tanner's creek and Wilson creek, at an elevation above the high water mark of the Ohio river. As regards Wilson creek, from what I could gather in a cursory examination, it appeared much too short to answer our purpose. To attain the necessary summit by passing up Wilson creek valley, would require a grade much too abrupt to be compensated for by any advantage the line could offer. By selecting Tanner's creek, the necessity of crossing any of these streams near their mouths, is obviated, the line running on the east bank of Tanner's creek upwards of three miles, and crossing by a bluff bank which offers on either side. The permanent location already made in Lawrenceburgh, has in view the continuation of the line on the east bank of Tanner's creek, as above stated. Commencing then at the corner of Main and — streets, near Mr. Tousey's house, Lawrenceburgh, the line was located at the request of the Directors of the Lawrenceburgh and Indianapolis Rail Road Company, through Newtown for about one mile, (the estimates of which have already been furnished you). From this point, instead of immediately crossing Tanner's creek as the former survey had done, the line was carried up the east bank of the creek, a distance of  $2\frac{1}{2}$  miles, gaining at the expense of an ascending and descending grade of 25 feet the mile more favorable ground, a better crossing place; avoids the abrupt curve necessary upon the opposite bank, and shortens the distance nearly a mile: advantages which more than compensate for the difference of grade between the two lines.

After crossing the creek at Station 130, the line follows the west bank, ascending by a very gentle grade to Station 288, near Mud Lick run, a distance of three miles. From the surface of this run, the height to be overcome in order to reach the summit, is 550 feet. Crossing this run then at an elevation of 30 feet, leaves 520 feet, or a grade of 37.69 feet the mile for 13 miles, the available length of the creek. The objection to this grade, is the height at which it will cross the runs opening into Tanner's creek. The sudden rise of this creek is in the last few miles; consequently, by assuming the most favorable grade within the two extremes, viz: 37.69 feet the mile, the road bed will necessarily cross the runs and ravines opening into the creek, when the rise of its bed is gentle, at an elevation greatly increasing the cost of construction. But a grade of 30 feet the mile for 10.5 miles, and a grade of 60 feet the mile for 2.5 overcomes the rise of the creek in the most favorable manner as regards *difficulty and cost of construction*. The line surveyed crosses Tanner's creek twice, one near Bullock's ford, and again just above the forks of the creek. The first crossing will be necessary to avoid the bend of the creek. It may not be necessary to cross at the forks, as the line when located will probably

keep the west bank of the creek, as far at least as Fly's run. Future examination, however, will determine this point. From the head of Tanner's creek, the line taking the level ground, passes over Hogan creek, the breaks of Ripley, (a branch of Laughery creek), Little Laughery and Main Laughery, just touching the breaks of Pipe creek. At the crossing of Main Laughery, a short descending and ascending grade of 25 feet the mile will be necessary. After passing Main Laughery, the descent is quite gradual, until we reach a branch of Salt creek, a distance of  $3\frac{1}{2}$  miles. From this branch the country rises until we attain the ridge dividing the tributaries of White River and White Water, at an elevation of 575 feet above the Ohio river. This is the highest point on the line. The grades, however, both to and from this point are quite gentle. From this summit to Greensburgh, the ground descending gradually, is very much cut up by the breaks of Sand creek. Sand creek itself is crossed favorably about one mile east of Greensburgh, the line passing for the last few miles near the Brookville road. After touching the eastern extremity of Greensburgh, the line crossing the Muddy Fork of Sand creek, passes over very favorable ground until it reaches Clifty. This stream in common with most of the easterly branches of White River, runs through a low wide bottom with bluff banks on either side. In order to cross it advantageously the line follows a southerly branch of it to the main stream, about half a mile above the Michigan road, immediately opposite which point another branch opens. The line after crossing Clifty follows this branch to the dividing summit between Clifty and Flat Rock river.

Immediately above the forks of Flat Rock river, about  $1\frac{1}{2}$  miles above the Michigan road, two streams empty themselves. The one from the North (Wolf Pen branch,) into the main stream: the other from the south (Eaton's branch) into what is called Little Flat. The line descends by Eaton's branch to the bottom, crosses both the forks, and follows Wolf Pen branch to the table land. A descending and ascending grade of at least 35 feet to the mile will be necessary to pass this stream.

After leaving Wolf Pen branch, the line is direct seven miles to a point on the Michigan road, near Loudon's tavern, leaving St. Omer about  $1\frac{1}{2}$  miles to the west, crossing Conn's creek about half a mile above the village of Middletown, and Buck creek about a quarter of a mile above the Michigan road. From this point (Loudon's) two lines were run: one passing through Shelbyville, and crossing Blue river near the bridge on the Michigan road: the other leaving Shelbyville about  $1\frac{1}{2}$  miles to the west, crossing Blue river at what is called the High Bank, and intersecting the Michigan road again near Brandywine creek, at which point it unites with the line through Shelbyville. The Plans and Profile will shew the relative merits of these two lines. After crossing Brandywine creek, for the convenience of survey, the line follows the Michigan road to a point about half a mile from its intersection with the National Road, where it bears more to the west, and enters Indianapolis near the junction of the National Road from the east with Washington street, which street it follows to a point opposite the State House, where the surveys were terminated.



Between Shelbyville and Indianapolis the face of the country, for some miles on either side of the Michigan road, is very much the several, and offers no obstruction to the formation of a direct line of Rail Road between the two points. The route surveyed, is for the most part direct, after reaching the head of Tanner's creek it is particularly so. The necessity of following the valley of this stream, renders this division of the line rather indirect. Again, at the crossing of Flat Rock river, some short curves are necessary, in order that the line may accommodate itself to the ground, but in no instance on the whole line, need the curves to be of a shorter radius than 1200 feet. The grades are gentle, with a very few exceptions. Ascending grade towards Indianapolis of 17.82 feet per mile. The total difference between the ascents and descents is 220 feet, making the State House, at Indianapolis, 220 feet above high water mark at Lawrenceburgh. The grade of 60 feet the mile for two miles, on Tanner's creek, cannot, by any means, be considered objectionable, considering the nature of the ground. If the design was to construct that portion of the road with the most gentle grade possible, the grade could not be reduced within 37.69 feet per mile for 13 miles, the summit being 520 feet, and the available length of the creek 13 miles. The power necessary to overcome this grade, taking the trade at its maximum, is to the power necessary to produce the same effect on a grade of 60 feet the mile, as 18.12 : 25.90. Now whether the motive power be horse or steam, the additional power necessary to overcome this latter grade, can be maintained at a cost much less than the interest of the difference of cost of construction of the two lines. That is to say, that the cost of constructing the road with a grade of 37.69 feet the mile for 13 miles, will so far exceed the cost of constructing it with a grade of 30 feet the mile for  $10\frac{1}{2}$  miles and 60 feet for  $2\frac{1}{2}$  miles, that the interest of the difference will more than maintain the additional power necessary to overcome the latter grade.

### 3. PLAN OF CONSTRUCTION.

In the construction of a work like the one under consideration, the importance and ultimate success of which is readily foreseen, it would seem sound policy to make the construction as permanent as possible, and not of acknowledged perishable materials, with the intention of renewing them, when the profits resulting from the actual operations of the work, would warrant the additional expenditure.

Of the different methods of constructing a Rail Way, most of which have been adopted in this country, the preference is undoubtedly due the edge rail and stone block. It is susceptible of greater accuracy and finish, allows a more perfect drainage to the road bed, and is from the nature of its materials, in point of permanency, as perfect as art can make it. But a Rail Way, constructed of more perishable materials (viz: flat bar wooden string piece and sleeper) is equally serviceable whilst the materials last; is more readily adjusted to the plane of the road; is less liable to derangement from frost, and to accident from the



fracture of a rail; the necessary repairs are conducted with more ease; and it is far less expensive.

As it may be sometime before the traffic on this road would justify the increased outlay of capital necessary to construct a road of the most durable materials, I would recommend the graduation of the road bed for two tracks, and the formation of one track with the necessary turn-outs, on the following plan:

Sleepers laid transversely of the road at intervals of three feet, each end of the sleeper (under the string) supported by broken stone rammed in pits of about 18 inches cube, to prevent derangement from the action of the frost; notched to receive the string piece which is confined to its place in the notch by a wooden wedge; upon the string is to be spiked the iron rail, two inches in width by half an inch thick. A road constructed upon the above plan, with locust sleepers, and pine or white-oak string pieces, will, with occasional repairs, answer all the purpose of the company until such time as they may feel justified in incurring the additional expense of a double track of more lasting materials; by which time the embankments will have become so far consolidated as very much to facilitate the construction. There is, of course, a saving in expense, by adopting in the first instance, those materials for the construction of the road which can be most readily obtained. The timber most generally in use for strings is pine, either the Southern or Susquehanna. I have seen no timber on the line of road that is considered equal to it for that purpose. White-oak might be procured along the line in sufficient quantities for sleepers, in case a supply of locust could not be obtained, and it could be used to advantage perhaps in the strings, but for that purpose is considered inferior to the pine. In localities where stone abounds, such as Flat Rock river, Turner's creek, &c., it might be advisable to construct parts of the road with the wooden string piece, resting on stone blocks, confined by iron knees; this method has several advantages: it affords a better drainage to the road bed; the strings will probably last longer, and, in the event of horse power being the motive power, it would save the expense of forming the horse path of broken stone.

In many situations it will be found expedient to vary the plan of construction a little to suit the nature or quality of the ground, or of the materials used. A few turn-outs will answer until the trade on the road shall have become established, the Company can then decide whether it will be more to their interest to construct an additional track, or whether an additional number of turn-outs will accommodate the trade. The following statement will show the relative cost of a single track of edge rail, and of flat bar and sleeper.

Cost per mile of a single track of flat bar Rail Way:

22 tons iron rail, 24 $\times$ $\frac{1}{2}$	a \$49 00 per ton	\$1,078 00
Splicing plate and screw-bolts, 782 lbs.	9	70 38
Iron spikes, 713 "	9	64 17
Susquehanna pine scantling 6 $\times$ 6, 31680 ft. 26		823 68
1,760 black locust sleepers,	25	440 00
Bearing timbers under sleepers, 10,560 ft.	3	316 80
Excavating trencher for " 1,040 cub. yd's.	10	104 00
Dressing and notching sleepers,	10	176 00
Laying sleepers and strings, per sleeper,	15	264 00
3,520 wooden wedges,	2	70 40
Fitting plates under joint and laying rail,	2 per yard,	35 20
Horse path		300 00
		<hr/>
		\$3,742 63

Cost per mile for the edge rail and stone block, single track:

3,520 yds. edge rail, 35 lbs. per yd., 53.43 t'ns, a \$50 pr. ton	\$2,671 50
3,520 cast iron chains, 12 $\frac{1}{2}$ lbs., per ch., 1964 tons a \$40 "	785 60
10,560 keys, 3 $\frac{3}{4}$ oz., 2200 lbs. a	7 c. 154 00
7,040 bolts, 9-16 diam., 5 inches long	6 421 40
3,520 stone blocks, 18 inches square, 12 in. deep,	60 2,112 00
Excavation of trenches 30 in. wide, 20 in. deep,	
1,630 cubic yards,	20 326 00
1,760 perches broken stone,	80 1,408 00
Filling and ramming "	15 264 00
Laying blocks, per yard,	7 123 20
Dressing 3,520 blocks	8 281 60
Drilling " "	6 211 20
Cementing bolts to " per block	2 70 40
Laying rail, per yard,	8 140 80

Total cost per mile of the edge rail

\$8,970 70

#### 4. COST OF GRADUATION.

The graduation has been estimated for a double track at a width for the road bed of 24 feet, with a side slope, in cuts of 1 to 1, and in embankments of 1 $\frac{1}{2}$  to 1.

For the convenience of calculation the line is divided into three divisions, which are again subdivided into sections of such length that the excavation and embankment may balance each other as nearly as possible.

At the crossing of streams, when the span did not exceed 30 feet, a simple platform bridge has been estimated; when the span was greater, the estimate has been made for Col. Long's patent frame bridge.

The cost of graduation of the first division extending from station 0 to station 966, at the head of Tanner's creek, a distance of 19.41 miles may be stated as follows:

392,788 cubic yards excavation,	a	10	\$39,278 80
431,783 " " embankment,		11½	49,655 04½
6,598 perches masonry, per perch,		\$03 80	25,072 40
550 feet bridging		20	11,000 00
Clearing and grubbing			3,600 00
			<hr/>
			\$128,606 24½

Graduation of the 2d Division extending from station 966, at the head of Tanner's creek to Flat Rock river, a distance 32.57 miles:

618,260 cubic yards excavation,	a	10½	\$64,917 30
766,851 " " embankment,	a	12	92,022 12
8,700 perches, per perch,		\$4 20	36,540 00
211 feet bridging,	a	20	4,220 00
Grubbing and clearing			14,572 80
			<hr/>
			\$212,272 22

Graduation 3d Division, from Flat Rock river to Indianapolis, a distance of 42 miles:

424,752 cubic yards excavation,	a	\$0 11	\$46,722 72
1,050,299 " " embankment,		12½	131,287 37½
11,100 perches masonry, per perch,		4 85	53,835 00
770 feet bridging,		20	15,400 00
Grubbing and clearing,			31,859 20
			<hr/>
			\$269,104 29½

Total cost of the road bed from Lawrenceburgh to Indianapolis, a distance of 94 miles,

\$609,982 76

Average cost of the road bed, per mile,

6,489 12

To which add the cost of superstructure of one mile on the proposed plan,

3,742 62

Total cost per mile,

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\$10,231 81

Or, for 94 miles of Rail Road

\$961,790 14

To which add for turn-outs

5,886 00

For contingencies, pay of Superintendents, Engineers, &c., add 10 per cent.

96,179 01

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\$1,063,855 15

Making the average cost, per mile, including a turn-out once in five miles

\$11,317 60

It cannot be supposed, in a line embracing such an extent of country, that in all cases the most favorable ground has been selected. In a survey, purely experimental, the results can only be an approximation. The estimates, however, on the present line, may be safely assumed as a maximum, it is presumed that any alteration made in the location will be for the better.

In the field duties, whilst in your service, I have been ably seconded by Messrs. W. W. Torbert and Chas. J. McNeil; and to Mr. W. W. Torbert's zeal and assiduity I am extremely indebted for the accuracy and despatch with which the calculations have been furnished.

I have the honor to be, Sir,

Your obe'dt servant,

JULIUS W. ADAMS.

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INDIANAPOLIS, December, 1835.

HOWARD STANSBURY,

*U. S. Civil Engineer.*

Sir—

The results of the surveys for a Rail Road from Columbus to Jeffersonville, which, in September last, you did me the honor to entrust to me, are respectfully submitted in the following

### REPORT.

The map of the country between Columbus and Jeffersonville, demonstrates to the first glance of examination, that whatever minor differences may exist between the various practicable routes for a rail road connecting those points, common to all will be the necessity of overcoming the elevations of two ridges. The one, that which separates the waters of the East or Driftwood Fork of White river from those of the Muskakatack:—The other, dividing the waters of the Muskakatack from those of Silver creek, and other immediate tributaries of the Ohio.

Bounded by these ridges, and of course, crossing the direction of the contemplated road, is the valley of the Muskakatack divided into the valleys of the Vernon, Graham, and Stucker's Forks. These "Forks" unite some five or six miles westward of a direct line from Columbus to Jeffersonville, and the question arises; whether it would be better to cross the valley below their junction, at the expense of some increase of distance; or to cross them separately at the expense of the ascent and descent of the ridges dividing them. The solution of this question is dependent upon the elevation and character of these ridges, the peculiar nature of the Muskakatack valley, and the position in the valley of those points at which access to it and egress from it may be most feasible; a knowledge of which must be obtained by actual examination of the ground.

Throughout the whole line, this is the only doubt of other than mi-



nor importance, which is to be solved: Elsewhere, the geography of the country directs too plainly to admit of error.

The valley of the East Fork of White river, upon which Columbus is situated, preserving for a considerable distance a very favorable direction, is to be pursued to that point at which observation shall determine the propriety of relinquishing it and crossing the ridge separating it from the Muskakatack. This ridge and the valley of the Muskakatack being crossed, and the elevation of the ridge which is the southern boundary of the Muskakatack being attained, the valley of Silver creek conducts to the Ohio three miles below Jeffersonville.

Thus it is seen that the geographical divisions of the road are three:

1st. The Northern or East Fork Division.

2nd. The Middle or Muskakatack Division.

3rd. The Southern or Silver creek Division.

Difference in facility of communication with the markets as they at present exist in the country, in population, in productiveness of soil and proportion of cultivation, will, by creating upon these portions of the route a difference in the value of provisions, cause upon them a variation in the cost of execution of similar work. Therefore in the estimate, these divisions shall be adhered to, and also in the description of the route, that it may accord with the estimate.

We proceed to a description of the route as surveyed, and an explanation of the causes which induced the selection of the ground which was selected, in preference to any other.

### 1st. THE NORTHERN OR EAST FORK DIVISION.

The commencement of this division is Columbus. Its termination is the summit of the ridge between the East Fork of White river and the Muskakatack. Its length is 19 miles 960 yards. The town of Columbus is situated on a bluff of small elevation, (about 20 feet) above high water mark of the East Fork of White river. Immediately below the town, Haw creek, a stream of inconsiderable size, joins its waters with those of the East Fork. Immediately at Columbus, the line descends from the bluff on which the town is situated, and enters upon the alluvial flat, here common to the East Fork and Haw creek, and subject to inundation by the waters of both. Within the first mile, Haw creek is crossed, where a bridge of 20 feet will be required to vent its waters. Without change of course, the line continues from Haw creek in the alluvial bottom of the East Fork, and near the termination of the third mile from Columbus crosses Clifty creek. This is an important stream, and drains a large extent of country. It will require a bridge of 120 feet span. The course still unchanged and the character of the ground remaining the same, the line next encounters Little Sand creek, a small stream which enters the East Fork near the termination of the seventh mile from Columbus. A bridge of 20 feet will here suffice. Immediately after crossing Little Sand creek, it becomes necessary in order to accommodate the line to the direction of the valley of the East Fork, to make a slight deflection to the West,

whereby a course is assumed which can be maintained, without variation, for 4½ miles to a point 10½ miles below Columbus. Here the high land approaches nearer to the stream, and a second bottom occurs, which being entirely above the reach of the freshets, the route passes over it, in excavation averaging a depth of about 3 feet.

Upon this second bottom the town of Azalia is designed. The line passes, on the ninth mile, a very short distance west of it. At the end of the tenth mile, this second bottom falls off into the low lands bordering Big Sand Creek. This stream enters the East Fork, near the commencement of the eleventh mile. It will require a bridge of 120 feet span. Shortly after crossing Big Sand creek, it is found that the high ground binds more closely upon the channel of the East Fork, and causes in its course a considerable variation westward. To this variation the line is accommodated, and runs from this point to that at which it leaves the valley of the East Fork to ascend the ridge between it and the Muskakatack, generally immediately along the foot of the hills. Some few points, of inconsiderable length occur, at which the alluvial flat disappears, and the base of the hills is washed immediately by the river. At these points the side cutting which will be necessary, is of small extent, and being entirely in earth easy of excavation, will not be expensive. Immediately above the village of Rockford, which by our route is seventeen and one fourth miles from Columbus, the hill recedes from the river, which immediately below the village it again approaches, thus forming an alluvial basin, in form approaching a semicircle, subject to inundation by the waters of the East Fork of White river. The line runs from point to point of the hills on the eastern limits of the town plat; of course in embankment, but preserving a good alignment, which would be entirely sacrificed by adhering to the face of the bluffs. A short distance below Rockford, and 19½ miles below Columbus, the route leaves the valley of the East Fork and commences the ascent to the summit between that stream and the Muskakatack. This ascent is facilitated by the valley of a small stream, which approaching the East Fork to within a short distance of it, sinks and discharges itself through a subterraneous channel. That part of its valley which is near to the low lands of the East Fork is wide, and its course very direct. Approaching its head it becomes narrower and more crooked, with low bluff banks, which gradually recede into a gentle margin, and at last entirely disappear in the Flat Woods, in which the stream takes its rise. Throughout its whole course it creates on the face and in the crest of the ridge a remarkable indentation, deep, and bounded by long and gentle slopes. From the point of deflection from the valley of the East Fork, the line is straight for the distance of one mile nine hundred and twenty feet, crossing the Sinking Branch and occupying what may be termed its second bottom, until it reaches the flat woods, the waters from which flow through the Sinking Branch into the East Fork, and through some other streams of about the same size, into the Muskakatack. The elevation which is surmounted in this distance of one mile nine hundred and twenty feet is thirty-five feet, being at the rate of 29.80, say 30 feet per mile. To

obtain this grade and preserve a straight line, it will be necessary to make a cut half a mile in length, and averaging in depth ten feet. In order to ascertain if this cut were avoidable, a line was run, following strictly the valley of the Sinking Branch to its head, and connecting there with the original line. The result was the ascertainment of the fact, that the cut could be reduced to a length of a quarter of a mile, and an average depth of six feet. but at an expense of distance and curvature more objectionable than its execution. The original line was therefore adopted.

Having thus given a description of the first division, which in connection with the maps and profiles, will, it is hoped, be sufficiently explanatory, we proceed to mention some general facts touching the whole division, and briefly to compare the line surveyed with whatever alternative route materially differing from it, may seem to have existed. It will be perceived by reference to the profiles, that the first eight miles of the line, extending from Columbus below little Sand creek, is for the most part in embankment, varying in height from 0.00 to 10 feet. This is accounted for by the fact, that within this distance the principal valley receives three tributaries; Haw creek, Clifty creek, and Little Sand creek, all of which, though the first and last named are unimportant streams, have broad alluvial valleys, subject to inundation. Between these streams the course of the bluff which bounds the immediate valley of the East Fork, is uneven, projecting in points and receding in coves. Any line run upon the face of this bluff would be circuitous and compelled to the frequent adoption of curves of short radii, and cuts through the points. Such a line might avoid the embankment in the bottom of the principal stream, but would have, in common with the line surveyed, to encounter that across the valleys of the tributaries, which constitutes a large proportion of the whole. This portion of the line surveyed consists of a tangent of seven miles; and, deflecting from it at an angle of but 10 deg. another four and a half miles in length. The original cost of construction would probably be somewhat greater than that of a line following the bluff, certainly far greater would be its value when constructed.

In addition to the bridges over the larger streams, several culverts will be required to pass the road over small branches, particularly on the portion of the division between Big Sand creek and Rockford, where the line runs immediately at the foot or on the face of the bluffs.

Good building stone is scarce, and will have to be brought to the line from points considerably distant. This transportation will materially enhance the cost of the masonry, but not to such a degree as to justify the substitution of brick. The only quarries of which information was obtained, are on Clifty creek about twelve miles above our crossing; on Mutton Fork of Muskakatack about six miles east of Rockford; and on Rock creek, a tributary of Big Sand creek, four miles east of Azalia. The two first are said to afford very good stone. The stone from the last is not of such quality as our purposes require. It is soft and laminated, rather than stratified. From among a quantity of it that had been brought to Azalia, some fine specimens of gypsum were obtain-



ed, which, from the best information that could be had, does not exist in sufficient abundance to make it an article of trade. At Rockford, the bottom of the river is an unbroken stratum of limestone, overlying which is a thin stratum of slate. White oak of the largest size abounds throughout this division.

## 2nd. The Middle or Muskakitack division.

The commencement of this division is the summit of the ridge between the East Fork of White River and the Muskakitack. Its termination is the summit of the ridge dividing the waters of the Muskakitack from those of Silver creek. Its length is 27 miles 800 yards.

As was mentioned in describing the first division of the route, that division terminates in flat woods, the water from which is drained into both the East Fork of White River and the Muskakitack. The line of the second division adopts the valley descending to the Muskakitack. This valley is a wide alluvial flat descending so gently and regularly that the plane of the road will be almost coincident with the natural surface. For two and a half miles from its head it runs in a very favorable direction, affording a route of straight lines connected by very gentle curves. At the termination of this distance (at Cox's Mill) the valley loses its favorable direction and bearing away to the east, discharges itself into an extensive pond formed by the waters of Mutton Fork and Vernon Fork of Muskakitack. At Cox's Mill the line relinquishes the valley and by an ascending grade and a very slight cut attains in one third of a mile the head of another small stream of similar character to the last, which it descends by a straight line over favorable ground and reaches in one and a half miles the alluvial bottoms of Mutton Fork and Vernon Fork of Muskakitack. Immediately at the commencement of these bottoms, Mutton Fork is crossed, requiring a bridge of 60 feet span. Three quarters of a mile from the crossing of Mutton Fork, the ground between them being subject to inundation to a slight depth, the line crosses the Vernon Fork at Stanfield's Mill. Here a bridge of 130 feet span will be required. About 8 miles above on the stream is a good quarry of limestone, the bottom at the crossing is of slate, and a Saw Mill is on the spot. Immediately after crossing the Vernon Fork, the line without variation of course, commences the ascent to the table land. This ascent is affected very favorably, the general direction of the Vernon Fork being oblique to the route, and the slope of the country to the stream being gentle. The line is run upon the face of this slope, straight, and ascending at the rate of 30 feet per mile, until an elevation is attained of 25 feet above the valley. This is found to be the greatest elevation between the Vernon and Graham Forks. The country between them is perfectly flat, except where broken by the valleys of the little branches emptying into the Vernon Fork. These branches are numerous within the first three miles from the crossing of that stream, and their valleys give to this portion of the profile an uneven appearance, but being narrow and shallow the whole amount of embankment which they will require is in reality but inconsiderable, and will be fully supplied from the slight cuts between them. The number of these small streams decreases as the distance becomes greater be-



tween the route and the Vernon Fork; and after the third mile from the crossing of that stream only two of them occur. These are called Little and Big Grassy. Where they are crossed they will require slight embankments, though as they approach their termination, their valleys increase rapidly in size, and would constitute obstacles of considerable cost to a line running much west of that surveyed. The whole distance from the Vernon to the Graham Fork is a little more than eight miles. The best route between them will not materially vary from a straight line. The valley of Graham is about 10 feet lower than that of the Vernon Fork. The line crosses Graham at Pierson's Mill, (better known as the Slate Ford;) where the channel of the stream is immediately at the foot of the bluff on the north and has a low alluvial bottom of considerable width on the south. The most favorable descent to the valley of the stream will be effected by cutting the bluff and filling the valley to the grade. The length of the requisite cut will be but one quarter of a mile—its greatest depth 12 feet—its average depth 6 feet. The necessary embankment will be 800 yards long, and of an average height of  $8\frac{1}{2}$  feet. A cheaper graduation might be made by adopting for the site of the line the face of the bluff, but it would involve a very oblique crossing of the stream or the introduction of a curve of shorter radius than is admissible. The line as run crosses the stream nearly at right angles, with a change of direction on approaching it, and another on receding from it, both of which are effected by short and gentle curves. The stream will require a bridge of 130 feet span. The bottom is of slate, affording an excellent foundation, a quarry of fine limestone is on the bank of the stream six miles above, and a Saw Mill is on the spot. The line across the alluvial bottom of Graham is straight, and reaches the high ground at the end of three quarters of a mile formed the stream. Immediately at the foot of this high ground is a bayou of Graham, which will require a bridge of 15 feet. From the valley of Graham the line ascends very favorably the valley of a small branch, the head of which is attained in the distance of two miles. Here a short cut will be necessary through the crest of a ridge which runs nearly east and west dividing the lesser tributaries of Graham from Huttoe's Branch, a small stream the course of which is from east to west, and its valley low and wide. To preserve a level grade across Huttoe's Branch, would require an embankment one and a quarter miles in length and 25 feet high. The slope of the country to it on either side being gentle, the grade is depressed and an economical line is the result. This stream is at times swollen by rains to such a size as to require a bridge of 20 feet. At the distance of one and a quarter miles from Huttoe's Branch, the line enters upon the alluvial bottoms common to Flat Creek and Stucker's Fork of Muskakitack. The ridge between Huttoe's Branch and this valley is thirty feet high. The line across it is straight—an ascending and a descending grade, requiring the excavation of a small portion of the ridge and the partial elevation of both valleys. A line was run around the point of this ridge, descending the valley of Huttoe's Branch to its junction with the valley of Stucker's Fork which

being found to involve adrupt curves and extensive embankments, was abandoned. The width of the low grounds of Stucker's Fork is three quarters of a mile. The line preserves across them the same course with which it enters them, crossing at the foot of the northern bluff, Flat creek with a bridge of 20 feet, and at the foot of the southern bluff (near Hubank's house and the ford on the Vienna and Slate Ford road,) Stucker's Fork, with a bridge of 40 feet span. The general course of Stucker's Fork from its source to its junction with Graham is but little north of west; its immediate course for about two miles above our crossing is north-west diverging slowly from the direction of the route. Between two and three miles above our crossing, Pigeon Roost Creek, a stream heading at Pine Lick Gap near the eastern termination of the Knobs and running east of north, empties into Stucker's Fork. The valleys of Stucker's Fork and Pigeon Roost are ascended by a succession of long straight lines, connected by gentle curves. The ground occupied is, generally, a wide second bottom, above highest freshets and, with the exception of some little valleys of branches, requiring culverts and slight embankments, is almost a perfect natural graduation. Five miles from Stucker's Fork, the State road from Lexington to Salem is crossed about half a mile west of Vienna, and about one and a half miles above the crossing of the State road, Pigeon Roost creek is crossed (near the house of Jackson Gray) by a bridge of 20 feet span, for the purpose of assuming the valley of a small branch which comes in from the south. This valley is narrow but very straight and the slope of the hills to it on either side is gentle. It affords, in every respect, a good line, and conducts, in the distance of one and a half miles from its mouth, to the summit between the Muskakitack and Silver creek on the farm of Carns Collins. The last mile only of the ascent to this summit will require the maximum grade of 30 feet per mile. With that exception the steepest grade between Stucker's Fork and the summit is not quite equivalent to 17 feet per mile, and that is continued only for a short distance.

Good building stone is scarce. The principal quarries are those on the streams, above the route, which have been mentioned already. Throughout the division the finest timber is abundant.

Lines of levels, run along the crest of the ridge, dividing the waters of Silver creek and other streams flowing directly to the Ohio from those of the Muskakitack and other tributaries of White River, during the prosecution of surveys to ascertain the practicability of effecting a communication by canal between the waters of White River and the Ohio at Jeffersonville, have demonstrated that the lowest point in that ridge is the gap through which our line passes. Its position is the most favorable possible.—A right line from Columbus to Jeffersonville would pass but one mile to the west of it, and Stanfield's Mill, where the line crosses the Vernon Fork, the Slate Ford, which is the point of crossing the Graham Fork, this lowest point in the ridge between White River and the Ohio, and Jeffersonville, are not one forth of a mile from the same right line.

A knowledge of the existence of this point was of much service, as it

obviated the necessity of running several lines whose only utility would have been the demonstration of their inexpediency.

As for a line crossing the Muskakitack below the junction of the Vernon and Graham Forks—though from the geography of the country it may seem a plausible route, yet the topography declares against it. The valley of the Vernon Fork, which such a route would descend for fourteen or fifteen miles, is uniformly very low and overflowed to a considerable depth, while the face of the hills is rendered uneven and abrupt by many and deep ravines. Elk Run, the only stream coming into Muskakitack from the south, which would promise egress from the valley below the junction, conducts into the Knobs, its sources interlocking with the heads of Big Blue River. Egress by the valley of Elk Run would therefore be impracticable, and a line crossing the Muskakitack below the junction must turn to the east and follow the valley of Graham's Fork until it reaches the junction with Graham of some other valley of a stream rising in the south. None however occurs until Stucker's Fork has emptied into Graham, about one mile above which point and about six miles east of Elk Run, Ox Fork unites with Stucker's Fork. The general course of Ox Fork is nearly north and south, its mouth being but a few miles east of the meridian of its source. Its valley conducts into the Knobs where its sources interlock with those of big Blue River. Between one and two miles east of Ox Fork, separated from it by a very high ridge, is Honey Run, a short stream the valley of which is narrow and crooked, and its source several miles north of the heads of Silver Creek. About two miles east of Honey Run is Pigeon Roost Creek, the valley of which is ascended by the line surveyed. Thus it is seen that to cross the Muskakitack below the junction would involve, from the great amount of embankment necessary in the valleys of Vernon and Graham Forks, a more expensive graduation in proportion to distance, while the increase of distance would be much more than equivalent to the ascending grades encountered by the line surveyed.

### 3d. The Southern or Silver Creek division.

The commencement of this division is the summit of the ridge dividing the waters of the Muskakitack from those of Silver Creek; its termination is the bank of the Ohio River at Jeffersonville. Its length is 26 miles, 267 yards.

The commencement of this division is immediately at the head of a branch of Silver Creek. The line was first run descending the valley of this branch, but though its course was favorable for a short distance, it was found that it afterwards ran in an eastern direction and cutting through high bluffs of slate and limestone, became narrow and crooked. It descended also too rapidly to admit of a favorable grade. For these reasons it was abandoned and another line run, which descending from the summit at the rate of 30 feet per mile, crosses the valley of the first line and assumes the face of its South-western slope, continues on the face of this slope as far as the direction is favorable, and, relinquishing it where its direction changes, attains, by a cut of one third of a mile in length and average depth of about seven feet, the head of



another branch of Silver Creek, the valley of which is favorable in direction and grade. From this point to within six miles of Jeffersonville the line is in the valley of Silver Creek. About two miles from its head the stream cuts through a bluff of slate. Here, in order to avoid a sharp curve and to secure the best ground, the line crosses the stream by a Bridge of 20 feet, and from this point adheres to its western side, except at three places, all within two miles of this, where the preservation of a good direction renders it necessary to cross the points of bends in the stream. At all of these points the channel can be diverted, and the necessity for Bridges obviated. On the eastern side of the stream are several very high and long slate bluffs. Those which occur on the western side are short and generally so low that the road will be above them. About four miles from its head the stream assumes a more important character, and the hills receding, allow on the western side, the formation of alluvial bottoms of considerable width, which, with the exception of a few short points at which the bluffs, make into the stream, extend as far down the valley as it is occupied by the route. This alluvial ground is the site of the line. Near the end of the seventh mile from the commencement of the division Caney Fork is crossed, requiring a bridge of 20 feet span. Three quarters of a mile below Caney Fork, Blue Lick Fork is crossed by a bridge of 60 feet span. On the 12th mile of the division the stream enters the limestone stratum. Within one and a half miles below this point it will be necessary, in order to preserve a good direction, to make two slight cuts through points of the hills. In these cuts some loose lime stone will probably be encountered. The elevation of the line is such that the solid rock, the bluffs being low, will most probably be avoided. On the 15th mile of the division Muddy Fork of Silver Creek is crossed. Here a bridge of 100 feet span will be required. From Muddy Fork the line continues to occupy the alluvial ground for 2 1-2 miles, when it becomes necessary to encounter some cutting in the hill side in order to secure such an approach to an abrupt bend in Silver Creek as will allow the line to pass it without exceeding the limits of judicious curviture. The passage around the apex of this bend will require a curve of radius not greater than 1100 feet, and a cut partly through lime stone 400 yards long and eight feet in average depth. The deepest part of this cut is through the narrow ridge which constitutes the bank of Silver Creek on the one side, and Camp Branch on the other. These streams are for a very short distance nearly parallel, and not more than 500 feet apart. Their communication is subterraneous. From this bend the line passes for 1 1-4 miles over ground somewhat broken by lime-sinks, and requiring embankment, to the point at which Silver Creek is crossed. The crossing of Silver Creek is favorable—the banks on both sides being above high water, and composed of lime stone bluffs which will require but little masonry to convert them into perfect abutments. To this point, from the commencement of the division, the distance is 19 miles 410 yards, and the whole descent 156 1-2 feet.



After crossing to the eastern side of Silver Creek, the alluvial bottom of that stream is occupied for half a mile to the mouth of Lick Branch. Here the valley of Silver Creek is relinquished, and the line strikes across the country for Jeffersonville, distant 6 1-4 miles. From the mouth of Lick Branch the line will be straight for nearly 3 1-2 miles, passing over alluvial ground of uniform surface, and requiring but little labor to perfect the graduation. The ascent in this distance is 17 feet, overcome by an uniform grade of 4.93 feet per mile. This is the whole elevation between Silver Creek and Jeffersonville. The line here commences the descent to the Ohio. This descent is altogether 20 1-2 feet and will have to be effected in one mile by cutting a bluff and elevating the plain below it to the grade. This is owing to the peculiar formation of the country which falls off to the level of the alluvial plain upon which Jeffersonville is situated, not as it ascends from Silver Creek, by a long and gentle slope, but by two bluffs or benches, which appear to have been at different periods the immediate banks of the river. The ground between them is about two miles in width, and *ascends* gently toward the river, as does also the ground from the foot of the second bluff to the edge of the river bank. The first of these bluffs leaves the river considerably above Jeffersonville, and extends to Silver Creek three miles below. The descent leaves the river, a shorter distance above Jeffersonville and extends to Mill Run a stream which enters the Ohio between Jeffersonville and Silver Creek.

The line descending to the plain between these bluffs, crosses upon that plain Mill Run by a bridge of 20 feet span, and the line, *as surveyed*, with a view to descending from the first plain to that upon which Jeffersonville is situated occupies the ravine at Fischli's Springs. It was afterwards ascertained that owing to the depth to which the flats back of Jeffersonville were overflowed by the Ohio, it would be necessary to *keep up* the grade, and embank across them, and that consequently a better line than that surveyed would be a straight line from the summit between Silver Creek and the Ohio to Jeffersonville, which leaving Fischli's Springs on the west, would give greater distance on the high ground, thereby increasing the amount of excavation and diminishing the embankment.

The termination of the road at Jeffersonville is 2 1-2 feet above high water mark of the Ohio, and 160 feet below the summit at the head of Silver Creek.

High water of the Ohio at Jeffersonville is 183 feet below Columbus and 271.75 feet below Indianapolis.

It is deemed unnecessary to insert in this report the elevations of the principal points upon the line, as they can readily be ascertained by reference to the profiles, or the grades, which, favourable as they are, will doubtless be improved when the route shall be subjected to the critical examination necessary for a location.

Our experimental survey has demonstrated that in no case will it be necessary to exceed a grade of 30 feet per mile, that this will be required for but a very small proportion of the whole distance and that throughout the greater portion of the route long grades, of gentle inclination, and long levels can be obtained at little cost.

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Add for Engineers, Superintendants, &c. 10 pr. cent.

Total cost of road

\$721,394 80

Being an average per mile of \$9,861 65.

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# COLUMBUS AND JEFFERSONVILLE RAIL-ROAD.

## FIRST DIVISION.

No. of Section	Length in Miles	EXCAVATION			EMBANKMENT			Grubbing and Clearing	MASONRY			WALLING			BRIDGING			TOTAL COST.
		No. of Yards	Cubic Yards	Amount	No. of Yards	Price	Amount		No. of Perches	Price	Amount	No. of Perches	Price	Amount	No. of Feet	Price	Amount	
1	1	30,511	10	3,051 10	18,251	13	2,385 03	150 00	221	5 00	1,105 50				30	5 00	100 00	6,541 73
2	1				18,251	13	4,366 32	150 00	46	5 00	230 00				120	25 00	3,000 00	4,703 29
3	1				32,157	14	4,109 18	300 00	815	5 75	4,686 25							12,485 43
4	1				32,157	14	3,621 66	150 00	21	5 00	105 00							3,876 06
5	1				32,157	14	1,038 12	250 00	22	5 50	121 00							1,172 62
6	1				18,455	10	2,203 64	200 00	25	6 00	150 00							3,059 41
7	1				2,958	10	1,214 20	200 00	25	6 00	150 00							3,856 15
8	1				8,145	11	3,771 87	150 00	11	5 00	55 00							5,092 87
9	1						2,258 10	150 00										2,258 10
10	1				1,212 10	10	1,138 32	200 00	820	6 00	4,920 00				120	25 00	3,000 00	17,133 89
11	1				55	5 50	302 50	200 00										9,283 01
12	1				1,570	10	759 02	200 00	46	5 00	230 00							1,004 02
13	1				1,570	10	759 02	200 00	133	5 25	693 25							2,884 74
14	1				12,200	10	6,763 11	777 41	339	5 25	1,881 75							5,198 52
15	1				12,200	10	1,176 11	1,291 37	230 00	251	5 25	1,325 50						8,191 85
16	1				43,541	10	4,354 10	1,110 00	230 00	214	5 25	1,117 00						3,853 50
17	1				22,417	10	2,214 70	1,387 15	225 00	214	5 25	1,117 00						4,603 58
18	1				20,381	10	2,038 40	1,067 50	225 00	214	5 25	1,117 00						4,603 58
19	1				5,760	11	683 10	150 00										2,619 60
20	1				29,043	16	4,396 88	150 00	3272		\$18,113 25	5,760			28		\$8,200 00	\$ 86,991 87
19.55		212,184		\$29,010 03	210,359		\$31,972 50	\$4,780 00	3272		\$18,113 25	5,760			28		\$8,200 00	\$ 86,991 87

## SECOND DIVISION.

No. of Section	Length in Miles	EXCAVATION			EMBANKMENT			Grubbing and Clearing	MASONRY			WALLING			BRIDGING			TOTAL COST.
		No. of Yards	Cubic Yards	Amount	No. of Yards	Price	Amount		No. of Perches	Price	Amount	No. of Perches	Price	Amount	No. of Feet	Price	Amount	
1	1	3,237	10	323 70	10,384	11	1,164 21	425 02	313	5 25	1,643 95							3,563 10
2	1	7,933	10	793 30	8,000	12	967 30	100 00	184	6 25	1,150 00							2,871 41
3	1	8,158	10	815 80	13,517	13	1,737 31	250 00	150	5 25	787 50							4,117 31
4	1	3,258	10	325 80	4,054	13	605 02	250 00	300	5 25	1,575 00							2,905 43
5	1	1,295	10	129 50	3,469	16	4,075 41	250 00	237	5 25	1,252 00							20,873 54
6	1	11,828	11	1,182 80	13,255	20	8,631 60	400 00	814	5 60	4,588 40							3,722 67
7	1	8,591	11	859 10	27,500	15	3,225 00	350 00	442	6 00	2,652 00							15,780 58
8	1	5,085	11	508 50	4,555	15	608 25	400 00	184	6 00	1,104 00							7,386 51
9	1	1,273	11	127 30	10,441	18	2,939 92	350 00	256	6 00	1,536 00							2,681 60
10	1	3,015	11	301 50	10,441	18	2,939 92	350 00	195	6 00	1,170 00							12,977 69
11	1	2,232	11	223 20	6,038	16	966 08	250 00	35	5 25	182 50							2,916 32
12	1	9,984	12	1,114 08	42,900	20	8,581 80	400 00	184	6 25	1,150 00							25,070 47
13	1	12,200	14	1,722 42	42,900	20	8,581 80	400 00	281	6 25	1,743 50							4,587 85
14	1	5,330	11	533 00	12,125	15	1,818 75	350 00	281	6 25	1,743 50							9,321 71
15	1	20,125	14	2,817 50	17,115	13	2,229 85	350 00	358	6 00	2,148 00							15,098 30
16	1	20,125	14	2,817 50	17,115	13	2,229 85	350 00	358	6 00	2,148 00							4,028 35
17	1	20,746	14	2,904 41	35,449	16	4,071 84	350 00	50	6 50	3,250 00							15,098 30
18	1	3,355	15	3,355 00	37,731	20	7,544 30	250 00	850	6 50	5,525 00							2,110 36
19	1	9,960	10	996 00	1,095 00	18	1,792 50	350 00	93	6 50	604 50							3,531 31
20	1	1,743	11	174 30	3,065	19	3,241 35	350 00	185	6 50	1,202 50							1,783 32
21	1	2,810	11	281 00	12,011	13	1,692 10	375 00	138	6 50	908 00							3,258 10
22	1	4,786	10	478 60	12,011	13	1,692 10	375 00	138	6 50	908 00							1,783 32
23	1	9,960	12	1,195 20	3,764	13	459 32	350 00	92	6 50	604 50							3,258 10
24	1	11,896	12	1,189 60	3,764	13	459 32	350 00	151	6 50	981 50							1,783 32
25	1	10,922	12	1,092 20	13,640	14	1,909 60	175 00	254	6 50	1,651 00							3,258 10
26	1	9,438	12	1,131 36				175 00	112	6 50	732 00							2,602 62
27	1																	2,602 62
27.45		292,297		\$83,974 75	290,523		\$65,080 86	\$8,175 00	10081		\$20,070 40				135		\$7,401 00	\$ 176,311 00

## THIRD DIVISION.

No. of Section	Length in Miles	EXCAVATION			EMBANKMENT			Grubbing and Clearing	MASONRY			WALLING			BRIDGING In Rural Test.			TOTAL COST.
		No. of Yards	Cubic Yards	Amount	No. of Yards	Price	Amount		No. of Perches	Price	Amount	No. of Perches	Price	Amount	No. of Feet	Price	Amount	
1	1	9,915	12	1,189 80	8,656	13	1,125 28	350 00	335	4 80	1,704 00							4,369 08
2	3	11,722	14	1,641 05	8,500	13	1,105 00	300 00	330	4 80	1,584 00							4,104 08
3	4	4,024	18	721 32	12,229	13	1,301 07	350 00	370	4 80	1,776 00							5,181 64
4	5	8,902	18	1,692 36	12,983	16	2,077 28	350 00	390	4 50	1,755 00							3,178 28
5	1	1,300 24	3	300 24	6,008	18	6,008 18	130 00	114	4 50	513 00							565 16
6	1	2,624	9	262 16	6,004	11	600 00	300 00	178	4 50	801 00							1,096 84
7	1	10,663	11	1,231 82	6,632	12	725 51	325 00	271	4 50	1,210 50							5,634 09
8	1	9,008	10	900 80	12,720	13	1,651 77	275 00	86	4 50	387 00							1,502 80
9	1	4,230	9	423 00	12,039	11	1,655 46	325 00	264	4 50	1,188 00							4,027 46
10	1	5,629	10	562 90	7,530	10	753 00	300 00	118	4 50	531 00							1,703 00
11	1	20,556	30	2,055 60	13,922	11	1,229 08	135 00	132	4 50	594 00							2,360 80
12	1	6,213	25	6,213 00	14,400	12	1,735 20	300 00	146	4 50	657 00							2,009 00
13	1	5,629	10	562 90	14,430	14	2,020 20	150 00	1074	4 50	4,833 00							7,037 28
14	1	3,721	9	372 10	14,603	12	1,752 36	150 00	383	4 50	1,725 00							4,422 45
15	1	6,014	12	725 38	16,057	12	2,007 12	150 00	166	4 50	747 00							9,650 33
16	1	17,463	13	2,273 05	15,917	11	2,130 38	125 00	104	1 50	156 00							3,909 40
17	1	4,278	12	427 80	2,139 00	13	2,832 81	250 00	327	4 50	1,471 50							7,405 43
18	1	4,125	12	412 50	2,139 00	13	2,832 81	250 00	327	4 50	1,471 50							4,880 31
19	1	9,411	11	941 10	1,602 21	13	2,136 30	300 00	769	4 50	3,460 50							12,879 06
20	1	10,427	11	1,042 70	1,140 10	12	1,368 00	325 00	98	4 50	432 00							1,856 50
21	1	1,281	9	128 10	4,115 10	10	432 07	225 00	151	4 50	679 50							3,265 13
22	2	10,611	10	1,061 10	1,287 10	11	1,298 56	300 00	151	4 50	679 50							3,693 06
23	1	15,870	10	1,587 00	9,912	13	1,288 50	225 00	95	4 50	427 50							3,415 54
24	1	12,400	9	1,240 00	1,287 10	10	1,287 10	225 00	240	4 50	1,077 00							9,995 62
25	1	3,769	11	376 90	44,254	20	8,870 80	225 00	158	4 50	711 00							
	1,600	211,550		21,155 00	828,134	13	297,638	\$12,200 00	6206		\$28,515 50	9,001			1,302 00		\$6,875 00	\$ 113,886 53



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Our experimental survey has demonstrated that in no case will it be necessary to exceed a grade of 30 feet per mile, that this will be required for but a very small proportion of the whole distance and that throughout the greater portion of the route long grades, of gentle inclination, and long levels can be obtained at little cost.

The whole distance from Columbus to the Ohio at Jeffersonville is 73 miles 800 feet—not quite 9 miles longer than a right line from point to point.

The details of the cost of graduation, masonry, bridging, &c. upon the several sections of the different divisions, are exhibited in the annexed tables, the aggregates of which are as follows:

First division	\$86,931 87	average per mile	\$4,446 64
Second division	176,311 01	" " "	6,042 29
Third division	113,886 53	" " "	4,355 12
Total Amount Graduation Masonry, Bridging &c. from Col. to Jeff.	\$377,129 41	average pr. mile	\$5,155 46

The estimate has contemplated a graduation of the road bed of sufficient width for a double track, viz: 24 feet with slopes in excavation of 1 to 1, and in embankment of 1 1-2 to 1.

Agreeably to your directions a wooden superstructure has been estimated for, the details of which are as follows:

Estimate for one mile of Railway with flat bar and strings.			
22 tons iron rail	2 1-4 x 5-8 in. at \$49 per ton	\$1,078 00	
Splicing plates and screw bolts 782 lbs.	" 9 cts.	70 38	
Iron spikes 713 "	" 9 "	64 17	
\$31,680 feet Susquehanna pine			
Scantling 6 x 6 in.	" \$26	823 68	
1760 black locust sleepers	" 25 cts.	440 00	
Bearing timbers under sleepers 1,056 ft.	" 3 "	316 80	
Excavating trenches for bearing timbers 1040 cub. yds.	" 10 "	104 00	
Dressing and notching sleepers	" 10 "	176 00	
Laying sleepers and strings pr. sleeper	" 15 "	264 00	
3,520 wooden wedges	" 2 "	70 40	
Fitting plates under joint and laying rail per yd.	" 2 "	35 20	
Horse-tread		300 00	
Cost of 1 mile single track		\$3,742 63	

### SUMMARY.

Single track for the entire distance, 73 miles 800 feet	\$273,779 05
Fifteen turn-outs	4,905 00
Total cost of superstructure	\$278,684 05
" " graduation &c	377,129 41
Amount of graduation &c. and superstructure	\$655,813 46
Add for Engineers, Superintendants, &c. 10 pr. cent.	65,581 34
Total cost of road	\$721,394 80
Being an average per mile of	\$9,861 65.

It is not to be presumed that the trace of an experimental survey will occupy in all cases the precise ground of a location, the object of such a survey being rather the ascertainment of general facts than the determination of details. The line of construction will not however materially vary from that surveyed. As the estimate is strictly based upon the line *as run*, any improvements in the route which may hereafter be made, will of course tend to reduce the cost.

I thank you for having associated with me, in the performance of the surveys, gentlemen, whose untiring industry and great accuracy, the duties of the field were executed well and rapidly.

Very Respectfully,

Your Ob't. Serv't.,

RANDOLPH COYLE.

INDIANAPOLIS, December 16, 1835.

HOWARD STANSBURY,  
*U. S. Civil Engineer,*

Sir—

Your instructions, dated 9th May, 1835, directing an examination to be made for a rail way or turnpike road from Crawfordsville by way of Greencastle, Bloomington, Bedford, and Salem, to New Albany, together with the probable cost of constructing either or both works, have been complied with. I now offer for your consideration, the result of my labour.

Messrs. John P. Paul, and Fitzhugh Coyle, assistants, having reported themselves for duty, our operations commenced. The first few days operations caused me to suspect the project of constructing a rail way to be impracticable. Instrumental examination and farther progress confirmed me in my impression.

By reference to the maps you will discover that the road in order to pass through the points prescribed by law; necessarily passes over undulating country, crossing water courses nearly at right angles, thereby occasioning ascents and descents entirely inadmissible upon a rail way, which could only be removed by long deep cuts and heavy embankments, the cost of which would be so enormous, as to render any idea of the construction of the work, out of the question.

My remarks will therefore be confined to the turnpike road, the route of which I will divide for the convenience of reference, into six divisions; these are again subdivided into sections of two miles each.

First Division extends from New Albany to Greenville, 12 miles, (which I have made a point on both improvements contemplated in that section of the State.)

Second Division extends from Greenville to Salem—19 miles.

Third Division from Salem to Bedford—32 miles.

Fourth Division from Bedford to Bloomington—27 miles.



Fifth division, from Bloomington to Greencastle—40 miles.

Sixth division, from Greencastle to Crawfordsville—28 miles.—The whole distance amounting to 158 miles.

### FIRST DIVISION,

*From New Albany to Greenville—Length, 12.37 Miles.*

The flat land of the Ohio in the neighborhood of New Albany, is bounded by a range of hills, termed the "Knobs;" distant where the line encounters them, two miles from the Ohio river, the height of which where the road will have to cross it, is 500 feet above low water mark. Several points were examined with a view to ascertain the lowest and most favorable point of crossing, which resulted in a conviction, that the gap occupied by the present New Albany and Vincennes road, presents by far the most favorable ground for that purpose. This road follows an undulating ridge between two deep ravines running nearly parallel with each other.

The line of survey commences to ascend the hill near Leydon's tavern on the left of the old road, and winds along the north bank of the southern ravine, half way to the top of the hill, crosses over to the northern ravine, which it follows for a short distance, recrosses to the southern ravine, and follows the direction of it to the summit.

The graduation will be along the side hill, and in some instances will require a wall to support the embankment on the lower side. A ditch on the upper side, and small culverts constructed at proper intervals, will be necessary to pass the water under the road. Stone being convenient, the cost of the masonry will not be great. By making a cut of four and a half feet on the summit, we are enabled to overcome the elevation at a grade not exceeding three degrees, which is much more favorable than was at first anticipated.

The valley of Silver creek makes an indentation in the ridge, a few miles to the north, but it is believed that had the valley of this stream been pursued, the length of the road would have been considerably increased without any corresponding advantage.

The country between the Knobs and Greenville, is very undulating, and of a hard, compact nature, broken by Big and Little Indian creeks; together with other smaller branches, requiring bridges and culverts, the cost of which you will find by reference to the tables attached to the report. The whole cost of this division amounts to \$36,090 65, giving an average of \$2,917 59 per mile.

### SECOND DIVISION.

*From Greenville to Salem—Length, 18.72 Miles.*

The line on leaving Greenville, bears rather more to the north, and passes over country varying but little in its characteristics from that lying between the Knobs and Greenville, crossing Bear creek, Blue river, and their tributaries at right angles to their course, which will render the road more undulating than could be desired, but no difficulty will be experienced in effecting a graduation within the limit of



three and a half degrees. The land is generally heavy timbered, which will render the grubbing somewhat expensive. Stone for the road is found generally in the beds of the streams in sufficient quantities for the masonry that will be required on this division. The level of the street at the court house in the town of Salem, is three hundred and eighty-seven feet above low water mark, of the Ohio river at New Albany.

The whole cost of this division amounts to \$52,671 68 giving an average of \$2,813 66 per mile.

### THIRD DIVISION,

*From Salem to Bedford—Length, 32.12 Miles.*

The line from Salem pursues the route of the Orleans road for six miles, crossing Blue river, which requires a bridge of 60 feet chord, then changing directly more to the north, passes through Bono, crosses the East Fork of White river at Beck's ferry, follows the dividing ridge of White river and Guthrie's creek; crosses Guthrie's creek at the county bridge; Leatherwood creek at Olmstead's mill, and several other smaller branches, before reaching Bedford. The width of White river at Beck's ferry, is four hundred and fifty feet, three arches, one hundred and fifty feet chord each, will be sufficient to pass the water at all seasons. The foundations for the abutments and piers of this work, and also the abutments and piers of this bridge across Guthrie's creek require to be well timbered, in order to be secure from any liability to injury from freshets. An embankment two hundred and fifty yards in length and ten feet high, extending to the hills on either side of the river, will be necessary to prevent the water from flowing round the abutments.

The level of the bed of White river at Beck's ferry, is 118 feet above low water mark of the Ohio river at New Albany. The level of the street running east and west, near the court house in the town of Bedford, is 328 feet above low water mark of the Ohio river at New Albany.

The whole cost of this division amounts to \$133,220 88, giving an average of \$4,147 60 per mile.

### FOURTH DIVISION,

*From Bedford to Bloomington—Length, 26.79 Miles.*

The line pursues a course west of north, occasionally varying its direction in order to suit circumstances, towards Bloomington, crossing Salt creek at Kelsey's ferry, Gullett's creek, Clear creek, and several of their tributaries. I examined the country adjoining Clear creek (in order to get a level road) and compared it with the estimated route. My objections to the valley of the creek, are, 1st. The course of the stream would make the line of the road two miles longer. Second, the deep ravines putting into the creek from the east and west, require extensive bridges to vent the water at some seasons of the year. 3d. Steep bluffs of rough, massive, secondary lime stone rock, are occasionally encountered: these all entered into the calculation, and the

result was an entire conviction that it would be economy to appropriate this money in cutting down the ridges and filling up the valleys, thereby shortening the distance and placing the road on high ground, secure from any liabilities to interruption from freshets or other casualties. The grade of the road up Salt creek from Station 871, where the present road comes in contact with a very steep hill, can be made easy by continuing the line along the side hill to Station 884. Occasionally small valleys are encountered which may be filled up at a small expense.

The level of the street running north and south, opposite the Court House in the town of Bloomington, is 419 feet above low water mark of the Ohio river at New Albany.

The whole cost of this division amounts to \$83,753 97, giving an average of \$3,126 31 per mile.

### FIFTH DIVISION,

*From Bloomington to Greencastle—Length, 40.22 Miles.*

Leaving Bloomington, we pass over an undulating country for three miles, cross Stout's Branch of Bean Blossom, which requires a bridge 150 feet chord, before gaining the dividing ridge between Beanblossom creek and Jack's Defeat, which we follow until within half a mile of their junction, when we pass over to Jack's Defeat and continue on the right bank of the creek, descending gradually to its confluence with Beanblossom; cross Beanblossom creek, leaving the village of Mount Taber one quarter of a mile to the east; follow the valley of it on very favorable ground, intersecting White river half a mile below Gosport. The bridge across White river, must be six hundred feet long, and thirty-three feet high, in order to pass the water that occasionally floods the banks. Much attention will be necessary, in putting in the foundation for this work, in order to be secured from freshets. Piles driven, and cribbing fashioned in the best manner, must be resorted to as the natural bed of the stream is sand (perhaps quick sand will be encountered,) four arches, one hundred and fifty feet chord each, will, in my judgment, be necessary.

Thence the line passes through Gosport, and follows the winding of hills, crossing Eel river, Deer creek, and their tributaries and the National road two miles east of Putnamville, before reaching Greencastle. By reference to the map, you can discover a proposed line, differing in many points from the one marked out on the ground for which, due allowance has been made in the estimated cost of construction.

The level of the street running east and west in the town of Greencastle is 478 feet above low water mark, of the Ohio river at New Albany.

The whole cost of this division amounts to \$177,944 23, making an average of \$4,424 27 per mile.

## SIXTH DIVISION.

*From Greencastle to Crawfordsville—Length 27.85 Miles.*

From Greencastle, the line pursues nearly a north course over ground rendered somewhat broken and rolling by the Walnut fork of Eel river, Ramp, Raccoon, and Rattlesnake creeks, all of which require bridges. We then enter what is termed the Black Swamp, at a point about eight miles south of Crawfordsville. The character of the soil is alluvial, very flat, heavily timbered, and covered with standing water. It will be necessary to raise the road three feet above the natural surface of the ground: through this swamp and cut lateral drains, by means of which the water is drawn off to the neighboring low grounds. The swamp extends to a point about two miles south of Crawfordsville, where the country becomes more undulating, the line of survey enters the town from the south, and is terminated at the Court House.

The level of the street running north and south opposite the Court House in the town of Crawfordsville, is 393.50 feet above low water mark of the Ohio river at New Albany.

Whole cost of this division amounts to \$87,756 72, giving an average of \$3,151 05 per mile.

The assessment attached to this report, has been made for a road thirty feet wide on top, having in no case a longitudinal slope of more than three and a half degrees. The ground is to be well grubbed and cleared forty feet on each side of the centre, making an opening of 80 feet; and have ditches cut of such form and dimensions as will ensure the drainage of the road.

## RECAPITULATION.

Cost of 1st division, from N. Albany to Greenville	-	\$ 36,090 65
“ 2d “ from Greenville to Salem	-	52,671 68
“ 3d “ from Salem to Bedford	-	133,220 88
“ 4th “ from Bedford to Bloomington	-	83,753 97
“ 5th “ from Bloomington to Greencastle	-	177,944 23
“ 6th “ from Greencastle to Crawfordsville	-	87,756 72
		<hr/>
		\$ 571,438 13
Add ten per cent. for contingencies	-	57,143 81
		<hr/>
Total cost of road		<u>\$628,581 94</u>

Giving an average of \$3,978 36 per mile.

In closing this communication, it may be proper to advert to the effect the contemplated improvement would be calculated to exert upon the future prospects of this part of the State. Possessing a soil rich and productive, and a population industrious and enterprising, its energies are now subdued and its advancement retarded for the want of a good and neverfailing avenue to market. Deprived of the ad-



vantages of a communication by water with the Ohio river, the cost of transportation over roads which are rendered impassable for loaded teams by every heavy shower, is too great to afford a fair competition with articles of produce which find their way to market by other and cheaper channels. As the cost of transportation decreases, this disparity would be lessened, and its effects upon the resources of the country would be sensibly felt.

As these views, however, are such as must present themselves to every reflecting mind, it is not deemed necessary to enlarge.

Respectfully submitted.

EDWARD WATTS,

*Civil Engineer.*



NEW ALBANY AND CRAWFORDSVILLE ROAD—First Division, from New Albany to Greenville.

EXCAVATION—				EMBANKMENT—				Grub- bing & clear- ing		MASONRY in Perches of 25 cub. ft.		WOODEN BRIDGES in Lineal Feet.		Total Cost.		
No. of Sec. miles.	Cubic yards.			Cubic yards.			No. of yards.	Pr.	Amount.	No. of perch.	Price, \$	Amount.	No. of ft.		Price, \$	Amount.
	No. of yards.	Pr.	Amount.	No. of yards.	Pr.	Amount.										
1	19,886	10	1,988.60	5,764	20	1,152.80	90			356	4.	1,424.00	28	5.	140.00	4,795.40
2	30,576	11	3,363.36	8,648	12	1,037.76	700			497	.50	248.50				5,349.62
3	25,376	10	2,537.60	19,803	15	2,970.45	550			455	4.	1,820.00	28	5.	140.00	8,018.05
4	14,976	10	1,497.60	868	10	86.80	600			99	4.50	445.50				2,629.90
5	16,552	10	1,655.20	4,507	18	811.26	500			712	4.75	3,382.00	88	12.5	1,100.00	7,448.46
6	15,976	10	1,597.60	5,766	12	691.92	650			496	4.75	2,356.00	85	22.06	1,875.10	7,170.62
7	4,380	10	438.00	1,505	12	180.60	60									678.60
12.37	127,722		\$13,077.96	46,861		\$6,931.43	\$3,150	2,615				\$9,676.00	229		\$3,255.10	\$36,090.65

# NEW ALBANY AND CRAWFORDSTILLE ROAD—Second Division, from Greenville to Salem.

97

No. of Sec	Length	EXCAVATION— Cubic Yards.			EMBANKMENT— Cubic Yards.			Grub- bing & Clear- ing.	MASONRY IN PERCHES of 25 cubic feet.			BRIDGING— lineal feet.			Total Cost.
		No. of y'ds.	Pr.	Amount.	No. of y'ds.	Pr.	Am't.		No. of perch.	Price.	Am't.	No. of feet.	Pr.	Am't.	
1	1.63	12,096	10	1,209.60				340	356	4.50	1,602.00	28	5.	140.00	3,291.60
2	2.	14,976	10	1,497.60				650							2,147.60
3	2.	20,141	11	2,215.51	17,000	15	2,550.00	500	812	4.50	3,654.00	78	14.60	1,138.80	10,058.31
4	2.	16,110	10	1,611.00				450	230	4.75	1,092.50				3,153.50
5	2.	18,965	10	1,896.50				550							2,446.50
6	2.	16,176	10	1,617.60				425	675	4.75	3,206.25	110	25.	2,750.	7,998.85
7	2.	16,776	10	1,677.60				600							2,277.60
8	2.	14,976	10	1,497.60	1,580	18	284.40	400	574	4.75	2,726.50	140	30.	4,200.00	9,108.50
9	2.	21,932	11	2,412.52	1,865	12	223.80	600	712	4.50	3,204.00	76	10.	760.00	7,200.32
10	1.09	9,180	10	918.00	4,992	20	998.40	20	390	4.75	1,852.50	60	20.	1,200.00	4,988.90
18.72		161,328		\$16,553.53	25,437		\$4,056.60		3,749		\$17,337.75	492		\$10,188.80	\$52,671.68

# NEW-ALBANY AND CRAWFORDSVILLE ROAD—Third Division, from Salem to Bedford.

No. of Section.	Length in Miles	EXCAVATION. Cubic Yards.			EMBANKMENT— Cubic Yards.			Grub- bing &c.	MASONRY, in perches of 25 feet.			BRIDGING— Lineal Feet.			Total Amount
		No. Yds.	Price.	Amount.	No. Yds.	Price.	Amount.		No. ft.	Price.	Amount.	No. ft.	Price.	Amount.	
1	0.91	16,452	11	\$1,809 72	4,993	20	\$998 60	\$ 10	390	4 50	1,755 00	60	20	\$1,200	\$ 5,773 32
2	2.	23,208	10	2,320 80	5,971	12	716 52	450	356	4 75	1,691 00	60	20	1,200	6,378 32
3	2.	22,070	10	2,207 00	2,700	12	324 00	600	132	4 50	594 00				3,725 00
4	2.	21,932	10	2,193 20	7,956	11	914 94	430	231	5 50	1,270 50				4,808 64
5	2.	14,976	10	1,497 60				520	132	5 50	726 00				2,743 60
6	2.	14,976	10	1,497 60				380							1,877 60
7	2.	14,976	10	1,497 60				650							2,147 60
8	2.	14,976	10	1,497 60				500	66	5 50	363 00				2,360 60
9	2.	17,692	10	1,769 20	1,600	11	176 00	630	198	5 50	1,089 00				3,664 20
10	2.	14,976	10	1,497 60				550	66	5 50	363 00				2,410 60
11	2.	14,976	10	1,497 60	11,392	20	2,278 40	480	3,996	6 50	25,974 00	470	30	14,100	44,330 00
12	2.	14,976	10	1,497 60				750							2,247 60
13	2.	14,976	10	1,497 60				760	66	5 50	363 00				2,620 60
14	2.	14,976	10	1,497 60	10,000	11	1,100 00	650	2,998	3 50	10,493 00	170	20	3,400	17,140 60
15	2.	98,978	10	9,897 80				600	132	6 00	660 00				11,157 80
16	2.	53,421	10	5,342 10	6,240	15	936 00	500	132	4 00	528 00				7,326 10
17	1.21	16,223	10	1,622 30	6,240	11	686 40	150	1,600	4 25	6,800 00	130	25	3,250	12,508 70
32.12		404,760		40,640 52	57,092		8,150 86	8,610	10,495		\$52,669 50	890		23,150	133,220 88

## NEW ALBANY AND CRAWFORDSVILLE ROAD—Fourth Division, from Bedford to Bloomington.

No of Sec.	Length in miles.	EXCAVATION— Cubic Yards.			EMBANKMENT— Cubic Yards.			Grub- bidg & clear- ing.	MASONRY in perch's of 25 cub. ft.			BRIDGING— lineal feet.		Total Cost.
		No of yds.	Pr.	Amount.	No. of yards	Pr.	Amount.		No. of perch	Pr.	Amount.	No. Pr.	Am't.	
1	0.79	5,760	.10	576.00				40						616.00
2	2.	149,928	.15	22,489.20				450	1,161	3.50	4,063.50	140	2,800	29,802.70
3	2.	14,976	.10	1,497.60				670						2,167.60
4	2.	15,597	.10	1,559.70				600	422	4.	1,688.00	38	10	4,227.70
5	2.	24,976	.10	2,497.60				500	165	4.	660.00			3,657.60
6	2.	14,976	.10	1,497.60				525	66	5.	330.00			2,352.60
7	2.	14,976	.10	1,497.60				700						2,197.60
8	2.	92,745	.12	11,129.40	16,714	.13	2,289.82	600	184	5.	920.00			14,939.22
9	2.	14,976	.10	1,497.60				490	99	5.	495.00			2,482.60
10	2.	33,183	.12	3,981.96	6,480	.12	777.60	670						5,429.56
11	2.	22,381	.11	2,461.91				720						3,181.91
12	2.	29,588	.11	3,254.68				840	356	5.25	1,869.00	33	10	6,293.68
13	2.	14,976	.10	1,497.60				290	455	5.	2,275.00	33	10	4,392.60
14	2.93	14,976	.10	1,497.60				120	99	5.	495.00			2,112.60
26.79		463,014		\$56,836.05	24,094		\$3,067.42	\$72,153.007			\$12,79.550	244		\$3,840\$83,753.97



# NEW ALBANY AND CRAWFORDSVILLE ROAD—Fifth Division, from Bloomington to Greencastle.

100

No. Length of in Sec. miles.	EXCAVATION— Cubic Yards.			EMBANKMENT— Cubic Yards.			GRUB- BING, &c.	MASONRY in perches of 25 feet.			BRIDGING— lineal feet.			Total Cost.
	No. of yards.	Pr.	Amount.	No. of yards.	Pr.	Amount.		No. of perch.	Pr.	Amount.	No. of feet.	Pr.	Am't.	
1	2.07	14,976	10	\$1,497.60			450	99.5		495.00				2,442.60
2	2.	14,976	10	1,497.60			500	356.5		1,780.00	28	5.	140	5,280.36
3	2.	14,976	10	1,497.60			450							1,947.60
4	2.	14,976	10	1,497.60			370							1,867.60
5	2.	14,976	10	1,497.60			830							2,327.60
6	2.	63,575	10	6,357.50			700							7,057.50
7	2.	80,525	10	8,052.50			850	2,295.5		11,475.00	140	15.	2,100	22,677.32
8	2.	14,976	10	1,497.60			650	3,872.6.50		25,168.00	620	30.	18,600	56,825.04
9	2.	24,976	10	2,497.60			500							2,997.60
10	2.	20,904	11	2,299.44			450	356.5.00		1,780.00	28	6.	168	5,365.52
11	2.	21,171	10	2,117.10			550	840.6.00		5,040.00	46	5.00	230	9,886.50
12	2.	14,976	10	1,497.60			470							1,967.60
13	2.	14,976	10	1,497.60			520	1,359.6.50		12,083.50	160	25.	4,000	20,433.50
14	2.	14,976	10	1,497.60			700							2,197.60
15	2.	14,976	10	1,497.60			650	422.5.50		2,321.00	28	5.00	140	4,608.60
16	2.	33,967	11	3,736.37			450	66.5.25		346.50				4,532.87
17	2.	14,976	10	1,497.60			500	99.5.25		519.75				2,517.35
18	2.	22,104	11	2,431.44			620	1,713.5.50		9,421.50	150	25.	3,750	18,386.27
19	2.	14,976	10	1,497.60			700							2,197.60
20	2.15	14,976	10	1,497.60			430							1,927.60
40.22	461,910			46,960.75	138,864									\$177,944.23
								\$11,340	11,977	\$70,430.25	1,200			\$29,128

# NEW ALBANY AND CRAWFORDSTILLE ROAD—Sixth Division, from Greencastle to Crawfordsville.

No. of Sec.	Length	EXCAVATION— Cubic Yards.			EMBANKMENT— Cubic Yards.			Grub- bing & Clear- ing.	MASONRY IN PERCHES of 25 cubic feet.			BRIDGING. lineal feet.			Total Cost.
		No. of y'ds.	Pr.	Amount.	No. of y'ds.	Pr.	Am't.		No. of perch.	Price.	Am't.	No. of feet.	Pr.	Am't.	
1	1.85	32,853	10	3,285 30				450	2,192	4 75	10,412 00	178	23	4,094 00	18,241 30
2	2	86,484	10	8,648 40				880							9,528 40
3	2	14,976	10	1,497 60				450	179	6	1,074 00				3,021 60
4	2	22,934	10	2,293 40	2,234	12	268 08	500	194	6	1,164 00				4,225 48
5	2	28,800	10	2,880 00	1,924	12	230 88	440	653	6	3,913 00	23	5	115 00	7,583 88
6	2	14,976	10	1,497 60	4,629	12	555 48	690	893	6	5,358 00	70	15	1,050 00	9,151 08
7	2	14,976	10	1,497 60				500	256	6	1,536 00	28	5	140 00	3,673 60
8	2	14,976	10	1,497 60	4,629	12	555 48	620	1,280	6	7,680 00	90	15	1,350 00	11,703 08
9	2	14,976	10	1,497 60				640	99	6	594 00				2,731 60
10	2	14,976	10	1,497 60				800							2,297 60
11	2	14,976	10	1,497 60				950							2,447 70
12	2	14,976	10	1,497 60				900	712	6	4,272 00	46	5	230 00	6,899 60
13	2	14,976	10	1,497 60				930	198	6	1,188 00				3,615 60
14	2	15,983	10	1,598 30				450	98	6	588 00				2,636 30
27.85		321,838		\$32,183 80	13,416		\$1,609 92	\$9,200 67	54		\$37,784 00	435		\$6,979 00	\$87,756 72

[To follow p. 100.]



INDIANAPOLIS, Dec. 13, 1835.

HOWARD STANSBURY,  
U. S. Civil Engineer: }

Sir—

In conformity with your instructions, dated 8th September, directing us to make a survey and exploration with a view of estimating the probable cost of constructing a McAdamized Road from New Albany, on the Ohio river, via Greenville, Fredericksburgh, Paoli, Mount Pleasant, and Washington, to Vincennes, on the Wabash river, we beg leave to report.

One party (under the direction of Mr. J. W. Collins,) commenced operations at Vincennes, on the 25th September, and terminated their survey at a point on Lost River, about ten miles west of Paoli; to which point another party, (under the direction of Mr. E. Watts) commencing at New Albany directed their course, and also terminated their explorations. The distance of the whole line of survey, from New Albany to Vincennes is laid off into six divisions, which are the distances between the several towns (or points) named in our instructions—viz: From Vincennes to Washington, 20.41 miles; Washington to Mount Pleasant, 15.52 miles; Mount Pleasant to Paoli, 27.09 miles; Paoli to Fredericksburgh, 17.77 miles; Fredericksburgh to Greenville, 11.64 miles; and Greenville to New Albany, 12.37 miles. Total distance from New Albany to Vincennes, 104.80 miles. For the convenience of calculation, subdivisions of two mile sections are made. We submit as the result of our labour, for your consideration, the following detailed description of the country through which the road line passes; together with the estimates, &c., commencing at Vincennes and following the order of divisions as before mentioned.

## 1. VINCENNES TO WASHINGTON.

The most formidable obstacles occurring between these points, are the West Fork of White river; with the bottom land on each side, subject at times, to an overflow of several feet; four miles from Washington, and Montour's pond, an extensive, and during a great part of the year, impassable morass, stretching from the mouth of Flat creek, its northern arm many miles to the south. It was deemed expedient to cross this swamp near its northern extremity, at the place embanked for that purpose to accommodate the travel on the present road; and upon White river, Hawken's Ferry was selected as the site for a bridge. Between these points and the extremes, no difficulties occur to dictate any considerable deviation from a straight general direction.

From Vincennes the line of the road is direct over the level prairie on which that town is situated, to station 21, near the house of Mr. Kelso, where it crosses Little Prairie creek and follows on the north side of a small branch of that stream to station 29, in the old road. From this point it is straight as far as station 46, and thence follows the course of the road on very favorable ground to its crossing over Pur-



sell's Mill creek, from which a straight line ascends the main ridge between the waters of the Wabash and White rivers to its summit at station 73. After passing round Rose's Hill, and crossing a small branch, a straight line is pursued to station 96, and thence crossing considerable valleys near Dayson's and Snyder's, meet the old road at station 120; and its course is then pursued to Flat creek.

The ascent to the main ridge is effected easily, with a moderate grade upon ground well drained and but little broken. In descending, however, it is unavoidably necessary, to encounter a number of valleys and ridges dividing different streams flowing into Montour's pond. The necessity for doing so in order to maintain the proper direction, will occasion some undulation of grade, which, however, can easily be restrained far within the limit prescribed.

From station 150, on the west side of Flat creek, a straight line ascends immediately to station 165, the summit of the ridge dividing the valley of Flat creek from that of a small stream flowing to the south, which is crossed at station 163, and passing over a ridge, the summit of which is near the house of Mr. Westfall, descends and terminates at the head of Steene's Branch. The valley of this branch being favorable in point of direction, and offering an easy descent to the White River bottom, is followed to its mouth, whence the line is direct to Hawkin's Ferry.

From personal examination and the best information obtainable from persons residing in the neighborhood, possessing accurate knowledge of the country, it appears that a stratum of sand stone underlying, in all probability, a great part of this section of country, which it is very desirable should be used for a bridge foundation, makes its appearance in the bed of White river, at three points, viz, the Ford farthest south, where the bottom is a solid rock, used in time of low water by the travel of the present road. Hawkin's Ferry, a quarter of a mile above, used by the same in time of high water: and a singular rocky elevation in the overflowed valley known as Toms' Hill, about one mile and a half to the north. At Toms' Hill it is by no means certain that the rock extends the whole distance across the bed of the river, and the point is otherwise ineligible, inasmuch as it would occasion the necessity of passing over a deep pond or slough several hundred yards in width on the western, and one of the channels of Prairie creek on the eastern side of the river, besides increasing the entire distance across the river bottom. The ford presents an admirable site for a bridge, not however, essentially superior to that at Hawkins' Ferry, which is selected from its offering the advantages that it can be approached on ground less depressed beneath the overflow, and its being situated immediately in the direction between the opening of the valleys of Steen's creek on the west, and Hawkins' creek on the east, by means of which the road must descend to, and ascend from the valley of White River.

From the Ferry the line is direct to the foot of the bluff point south of Hawkins' creek. The direction of this creek is remarkably favorable, admitting the passage of the road on either side on a very easy grade all the way up to the town of Washington.

The most important variation from the route of the old road, occurs between White River and Flat creek. From this point, the road at present travelled, bears to the south, passing over three considerable valleys in its progress to the river bluff, which it descends very abruptly at the distance of one mile from the Ferry.

The line surveyed, has the advantage of entirely avoiding two of these valleys, and crossing the other within a short distance of its source; besides which the ground admits of lower grade, and the distance is less by half a mile.

The economy of distance, always a consideration of great weight, is peculiarly an object of importance upon this division of the road, from the fact that the country affords no stone suitable for McAdamizing, and the nearest point at which it can be obtained in sufficient quantities, being at a distance so great, that the expense of grading the bed of the road will bear an unusually small proportion of the rest of the work, including transportation, of stone, &c.

It will appear by the prices upon which is based the estimate of the expense of laying the metal upon the bed of the road, that they are, for the most part, unusually high upon this division, and it is deemed advisable to give the data upon which they are founded, in order that the resources of the country may be fully examined. The best information to be obtained, states the distance at which the suitable stone can be procured in sufficient quantity, to be about thirty miles above the point of crossing over the West Fork of White River. The analyses presumes that the hire of a boat worth \$150, and fifteen tons burthen, will be 50 c. per day. The hire of hands to manage it, \$5 per day; their subsistence \$1 per day; making \$6 50. That one trip can be made in four days, and transport seven perches of stone of twenty-five cubic feet. The expense of quarrying will be 40 c., making the cost \$4 11 per perch; in the vicinity of the bridge crossing White River. A team of six horses can be had for \$5 per day, and haul a perch of stone weighing about two tons, 17 miles in that time, or at the rate of  $29\frac{1}{2}$  c. per mile. The cost of stone at the river, with the addition of the cost of hauling the average distance, shews the price per perch, upon each division, as it appears in the tables of the estimate.

The total cost of graduation upon this division, amounts to \$121,901 31, making an average of \$5,972 62 per mile.

The cost of covering the road with stone amounts to \$449,977 37, or an average of \$22,046 90 per mile.

Whole cost of this division of the road when completed \$571,878 68, or an average of \$28,019 53 per mile.

## 2. WASHINGTON TO MOUNT PLEASANT.

Between Washington and Mount Pleasant no difficulties occur throughout to divert the route of the road from a straight general direction. The country is for the most part sufficiently level, the surface of the ground requiring, in few instances, the aid of art to subdue it within the limit of grade.



The line of the road passing through the main street of the town of Washington, and continuing a straight course eastward, crosses the valley of a small branch of Hawkins' creek, and passes over a depression to the head of one of the tributaries of Veal creek, following for a short distance in a favorable direction. From this valley commences the ascent to the main ridge over the southern declivity of the Black Oak Ridge, drained towards the south by the tributaries of Veal creek, and dividing them from the waters of Prairie creek flowing towards the north.

This ridge is followed advantageously, crossing the principal streams, to its summit, where the line descends into the valley of a branch of Prairie creek; crosses it near the house of Mr. Miller, and again rises over broken ground to the summit of the main dividing ridge between the East and West Forks of White River. In descending upon the south-eastern declivity of the ridge, the line runs for several miles upon the head waters of Hawk creek, and passing over a succession of low broad ridges and streams flowing towards the south, rises to the high bluff upon which is situated the town of Mount Pleasant. This ascent is effected by means of a flat spur of the ridge, and, together with the descent from the town, following a ravine falling towards the south to the alluvial bottom of the East Fork of White River, involves an increase of distance little less than half a mile, in order to preserve the grade.

Upon this division, the average distance of transportation of stone is less than 6 miles. It is found of good quality and in great abundance upon the East Fork of White River, and at a convenient distance from the banks, which will make the cost of this item of construction materially less than the same upon the first division.

The total cost of graduation upon this division amounts to \$25,634 82, making an average of \$1,651 72 per mile.

The cost of covering the road with stone, amounts to \$146,181 50; or an average of \$9,418 91 per mile.

Whole cost of this division of the road, when completed, \$171,816 32; or an average of \$11,070 63 per mile.

### 3. MOUNT PLEASANT TO PAOLI.

The East Fork of White River is crossed at the present ferry. The precise point, however, (as there is very little choice of site in regard to the foundation for a bridge) must be determined by future surveys upon the eastern side of the river, that it may fall in with the direction suitable for any change in the location of the road.

In this distance of three miles from the river, the transverse direction of the water courses imposes the necessity of crossing three considerable spurs of the branch ridge dividing the waters of Salt creek on the south, and the more immediate tributaries of White River on the north-east, the ascent to which is then commenced by means of the valley of a branch of the creek crossed at station 519, and attained in the distance of one mile. The course of this ridge is followed with

some deviations upon either declivity which the ruggedness of its character suggest, for the distance of nine miles, to the head of one of the branches of Sulphur creek. This branch unites with Sulphur creek in the distance of one mile, and the valley is pursued favorably to station 592, near the house of Mr. Wilson, and thence to a Bench Mark near Mr. Fossett's and about two miles west of Lost River. Four hundred feet from Bench Mark, is encountered a very high hill, the ascent and descent of which varies from  $4\frac{1}{2}$  to 5 deg., thereby causing deep excavations and heavy embankments to reduce it to the required grade. About a half mile from its eastern base, in the direction of our line, is Lost River, a considerable stream, and requiring a bridge of 200 feet span. Between this point and Paoli, a distance of eight miles, the country partakes of the general rough character of the division; in this distance four culverts of six feet span each will be necessary.

The rugged surface of the country between Mount Pleasant and Paoli, requires that a most thorough knowledge of its features should precede the ultimate choice of the route of the road, much more so than the short time allowed for the completion of the survey would admit. The line surveyed exhibits a section of the country in profile which demonstrates the practicability of obtaining grades within the limit of  $3\frac{1}{2}$  deg. upon a route very direct; no doubt is entertained, however, that further examination will shew the expediency of deviating, in some instances, very considerably, from its course, which, though perhaps slightly increasing the entire distance, will bring the expense of graduation below the present estimate upon this division.

Very good stone can be procured at some points immediately in the vicinity of the line. The average distance of transportation, however, will be about three miles. Timber of very good quality is obtainable within a short distance throughout.

The total cost of graduation upon this division amounts to \$168,686 89, making an average of \$6,204 75 per mile.

The cost of covering the road with stone, amounts to \$292,396 50; or an average of \$10,793 52 per mile.

Whole cost of this division of the road, completed, \$460,483 39; or an average of \$16,998 27 per mile.

#### 4. PAOLI TO FREDERICKSBURG.

The town of Paoli is bounded on the east by high hills. The line of survey in some cases passes round them, thereby avoiding deep excavations and high embankments, but increasing the direct distance somewhat.

The face of the country between Paoli and Fredericksburg presents a remarkably rugged appearance, and would require a much more extensive examination than our limited time would admit, before a satisfactory location of the intended road could be effected. After leaving Paoli, the country for six miles (to Hallowell's) is rough, not so much so, however, as to oppose any serious difficulties in construction. A



succession of small hills constitute its profile. Five branches are crossed in this distance, each requiring a culvert of 6 feet span. Stone for their construction is abundant. After leaving Hallowell's, in a distance of nearly seven miles (to Hardy's store), we encounter hills of an elevation nearly equal to the highest knobs in the vicinity of New Albany; some of them will require much labor in reducing to the required grade; in this distance one culvert of ten feet span will be required. From Hardy's store to Fredericksburg, a distance of about five miles, the country is undulating, and presents few difficulties.

The total cost of graduation upon this division, amounts to \$56,483 01, making an average of \$3,178 56 per mile.

The cost of covering the road with stone, amounts to \$94,454 20; or an average of \$5,315 37 per mile.

Whole cost of this division of the road, when completed, amounts to \$150,937 21; or an average of \$8,493 93 per mile.

## 5. FREDERICKSBURG TO GREENVILLE.

The line pursues a course south of east from Fredericksburg, descending into a valley which is occasionally overflowed by the waters of Blue River, and will require to be raised twelve feet above its natural surface, by an embankment connecting a bridge across the stream with the side hill upon which the town is situated. This embankment, sixteen hundred feet long, and also the grading of the hill in the town of Fredericksburg, will be very expensive. A more favorable place for crossing Blue River, is near the old bridge, leaving the town of Fredericksburg a quarter of a mile to the north. Stone and other materials that are necessary for the construction of the bridge, may be found convenient.

From Blue River the ground is favorable; occasionally small streams are encountered. The ridges may be easily reduced so as to allow the grade of the road to come within the limit of  $3\frac{1}{2}$  deg.

The total cost of graduation upon this division, amounts to \$42,500 55, making an average of \$3,654 39 per mile.

The cost of covering the road with stone, amounts to \$75,134 00; or an average of \$6,460 36 per mile.

Whole cost of this division of the road, when completed, \$117,634 55; or an average of \$10,114 75 per mile.

## 6. GREENVILLE TO NEW ALBANY.

The flat land of the Ohio river, in the neighborhood of New Albany, is bounded by a range of high hills, termed the Knobs, distant from the river where the line encounters them, two miles; and their summit where the road must necessarily cross, is 500 feet above low water mark. The country between Greenville and the Knobs is very undulating, and of a hard compact nature; broken by Big and Little Indian creeks, together with numerous small branches, requiring bridges and culverts, the cost and dimensions of which you will find by reference to the tables attached.

Several examinations were made with a view to ascertain the lowest and most favorable point of crossing the Knobs; which resulted in a conviction that the gap occupied by the present New Albany and Vincennes road, presents by far the most favorable ground for that purpose. This road follows an undulating ridge between two deep ravines, running nearly parallel with each other. From the gap near the summit, we follow, on the north bank, the direction of a southern ravine a quarter of a mile; cross to the south bank of a northern ravine, following it a short distance, then re-cross to the north bank of south ravine to a point about half way to the bottom, and from thence winds along until it reaches a point near Layden's tavern, on the old road; this point nearly corresponds with the general level on to New Albany, a distance of two miles. The graduation will be along the side hill, and in some instances will require a wall to support the embankment on the lower side, a ditch on the upper side, and small culverts constructed at proper intervals, will be necessary to pass the water under the road. Stone being convenient on this division, the expense of the masonry and stone covering will be comparatively small. By making a cut of four and a half feet on the summit, we are enabled to overcome the elevation at a grade not exceeding 3 deg., which is much more favorable than anticipated.

The total cost of graduation on this division, amounts to \$36,090 65, making an average of \$2,917 59 per mile.

The cost of covering the road with stone, amounts to \$81,906 50; or an average of \$6,621 38 per mile.

Whole cost of this division of the road, when completed, amounts to \$117,997 15; or an average of \$9,538 97 per mile.

The assessment attached to this report has been made for a road thirty feet wide on top, having in no case a longitudinal slope of more than three and a half deg., and covered with stone broken into pieces weighing not more than four ounces. The bed of the road is to be formed nearly flat, having a slope of one inch in three feet from the centre to the sides. Twenty feet of the centre to be covered to a depth of three inches with clean stone broken as above. Second year an additional covering of three inches will be put on. Third year three inches more will be necessary, leaving the McAdamized stone covering nine inches deep at the centre, and six at the edges. No stone to be used but such as are hard, as granite, flint or lime-stone.

#### RECAPITULATION.

Whole cost of graduating the road, from Vincennes to				
	New Albany, 104.80 miles,			\$450,697 23
"	"	stone covering,		1,140,050 07
Cost of	1st division,	from Vincennes to Washington,		571,878 68
"	2d	"	Washington to Mt. Pleasant,	171,816 32
"	3d	"	Mt. Pleasant to Paoli,	460,483 39
"	4th	"	Paoli to Fredericksburgh,	150,937 21
"	5th	"	Fredericksburg to Greenville,	117,634 55
"	6th	"	Greenville to New Albany,	117,997 15
Total cost of road from Vincennes to New Albany,				<u>\$1,590,747 30</u>

The painful duty devolves upon me in this place, to notice the death of my first assistant, Jno. P. Paul, late of Madison, Indiana. It was owing to exposure in the necessary execution of his duties that he first contracted the disease which resulted in his death. His urbanity of disposition, pleasing manners, and sociability of character endeared him to all of his associates. His loss was deeply felt and sincerely regretted.

Respectfully submitted,

EDWARD WATTS, }  
JAMES COLLINS, } *Civil Engineers.*



1	2.	18,615	12	2,9
2	2.	14,976	10	1,4
3	2.	14,976	10	1,4
4	2.	14,976	10	1,4
5	2.	21,198	10	2,1
6	1.63	21,989	11	2,4
	11.63	106,730		\$11,2

No. of Section	Length in miles.	EXCAVATION—		
		No. of yds.	Price.	Amount
1	0.37	4,380	10	43
2	2.	15,976	10	1,58
3	2.	16,552	10	1,65
4	2.	14,976	10	1,45
5	2.	25,376	10	2,53
6	2.	30,576	11	3,36
7	2.	19,886	10	1,98
	12.37	127,722		\$13,07

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Respectfully submitted,

EDWARD WATTS, }  
JAMES COLLINS, } *Civil Engineers.*

# VINCENNES AND NEW-ALBANY ROAD—First Division, from Vincennes to Washington

No. of Section.	Length in Miles	EXCAVATION— Cubic Yards.			'EMBANKMENT— Cubic Yards.			CLEARING and ordnance.	MASONRY. Perch—25 Feet.			BRIDGING G. in Local Feet.			METAL COVERING. Perches of 25 Feet.			TOTAL COST.	
		No. Yds.	Price.	Amount.	No. Yds.	Price.	Amount.		No. Per.	Price.	Amount.	No. feet.	Price.	Amount.	No. Per.	Price.	Amount.		
1	0.79	5,184	10	51,840	12,638	14	1,769.32	21,900	66	\$4.75	313.50	21,060	\$10.00	21,060.00	21,060	\$9.00	189,060.00	\$3,661.92	
2	2.1	11,976	10	119,760	270	12	32.40	3,240	488	5.00	2,440.00	18	5.	90.00	4,500	10	52,000.00	\$6,820.60	
3	2.1	11,976	10	119,760	3,220	12	393.60	4,728	231	5.00	1,155.00	18	5.	90.00	4,500	11	61,300.00	\$4,326.48	
4	2.1	11,976	10	119,760	3,575	12	429.00	5,100	150	00	99	5.00	495.00	32	5.	190.00	6,200.00	\$8,592.30	
5	2.1	11,976	10	119,760	12,003	16	1,920.48	30,000	712	5.00	3,560.00	32	5.	190.00	3,200	9	56,700.00	\$8,400.88	
6	2.1	11,976	10	119,760	4,201.5	14	588.30	8,400	425	00	435	5.25	2,283.75	18	5.	90.00	4,500	\$6,418.00	
7	2.1	11,976	10	119,760	4,334	15	650.10	9,000	500	00	500	5.00	2,500.00	32	5.	140.00	4,200	\$6,418.91	
8	2.1	11,976	10	119,760	4,497	16	719.52	9,990	500	00	500	5.00	2,500.00	32	5.	115.00	3,450	\$6,481.70	
9	2.1	11,976	10	119,760	11,557	16	18,069.12	20,000	600	00	336	5.00	1,680.00	23	5.	8,480.00	5,200	\$9,920.35	
10	2.1	11,976	10	119,760	11,557	16	18,069.12	20,000	600	00	336	5.00	1,680.00	23	5.	8,480.00	5,200	\$9,920.35	
11	1.62	14,563	10	145,630	3,450	30	4,930.50	13,965	100	00	99	5.00	495.00	30	5.	4,427	6	\$3,270.97	
12	1.62	14,563	10	145,630	3,450	30	4,930.50	13,965	100	00	99	5.00	495.00	30	5.	4,427	6	\$3,270.97	
90.41 170.024		\$17,006.09 19 10.07		\$29,316.72 \$3,485.00 8.878		\$52,408.50 777		\$19,355.00 33,903		\$419,977.37 \$571,879.68									

## SECOND DIVISION—From Washington to Mount Pleasant.

No. of Section.	Length in Miles	EXCAVATION— Cubic Yards.			EMBANKMENT— Cubic Yards.			CLEARING and entrenching.			MASONRY In Perches of 22 Feet.			BUILDING in Local Feet.			METAL COVERING— Perches of 22 Feet.			TOTAL COST.	
		No. Yds.	Price.	Amount.	No. Yds.	Price.	Amount.	No. Per.	Price.	Amount.	No. Per.	Price.	Amount.	No. Per.	Price.	Amount.	No. Per.	Price.	Amount.		
1	1.38	19,036	12	228,432	12,438	11	176,932	21,938.32	500	00	138	5	6,935.50	90	5	450.00	9,000.00	9,000.00	9,000.00	35,333.22	
2	2.1	14,976	10	149,760	12,438	12	153,216	183,954	300	00	455	5	2,275.00	18	5	90.00	4,500.00	4,500.00	4,500.00	30,034.00	
3	2.1	14,976	10	149,760	12,438	12	153,216	183,954	300	00	165	5	825.00	5	5	25.00	1,250.00	1,250.00	1,250.00	25,446.00	
4	2.1	16,176	10	161,760	12,438	10	124,380	146,818	500	00	66	5	330.00	5	5	25.00	1,250.00	1,250.00	1,250.00	21,983.60	
5	2.1	16,300	10	163,000	12,438	10	124,380	146,818	500	00	132	5	660.00	5	5	25.00	1,250.00	1,250.00	1,250.00	19,128.90	
6	2.1	14,976	10	149,760	12,438	10	124,380	146,818	500	00	198	5	990.00	5	5	25.00	1,250.00	1,250.00	1,250.00	16,237.60	
7	2.1	19,763	10	197,630	12,438	10	124,380	146,818	500	00	165	5	825.00	5	5	25.00	1,250.00	1,250.00	1,250.00	13,333.30	
8	1.14	9,803	10	98,030	11,436	11	126,396	137,826	490	00	389	5	1,945.00	30	5	150.00	3,000.00	3,000.00	3,000.00	12,535.30	
15.52 137.237		\$13,104.82		\$3,560.00 1,735		\$8,675.00 41		\$205.00 40,973		\$146,131.50 \$171,816.32											

## THIRD DIVISION—From Mount Pleasant to Paoli.

No. of Section.	Length in Miles	EXCAVATION— Cubic Yards.			EMBANKMENT— Cubic Yards.			CLEARING and Grading.	MASONRY In Perches of 22 Feet.			BRIDGING to Local Feet.			METAL COVERING, In Perches of 22 Feet.			TOTAL COST.			
		No. Yds.	Price.	Amount.	No. Yds.	Price.	Amount.		No. Per.	Price.	Amount.	No. Feet.	Price.	Amount.	No. Per.	Price.	Amount.				
1	0.86	5,790	10	57,900	7,346	13	486.98	500	00	3,996	5	50	21,978.00	470	30	1,000.00	2,270	2	3,000	4,094.00	42,654.98
2	2.1	18,047	11	198,517	7,384	13	955.92	650	00	3,055	5	50	1,677.50	15	5	75.00	5,260	2	3,000	12,144.00	17,488.29
3	2.1	167,976	11	1,847,736	14,377	30	1,437.60	500	00	4,555	5	50	2,302.50	23	5	115.00	5,260	2	3,000	13,300.00	31,794.86
4	2.1	14,976	10	149,760	14,377	30	1,437.60	500	00	2,311	5	50	1,370.50	50	5	250.00	5,260	2	3,000	16,593.60	16,593.60
5	2.1	14,976	10	149,760	14,377	30	1,437.60	500	00	66	4	50	237.00	50	5	250.00	5,260	2	3,000	11,150.00	24,441.86
6	2.1	16,804	12	2,016,480	2,514	96	4,300.00	600	00	66	4	50	237.00	300	5	1,500.00	5,260	2	3,000	24,441.86	24,441.86
7	2.1	16,804	12	2,016,480	16,207	14	2,668.98	500	00	99	4	50	445.00	50	5	250.00	5,260	2	3,000	21,120.00	32,219.89
8	2.1	60,457	13	7,254,813	884	14	123.76	500	00	1,134	4	50	5103.00	50	10	500.00	5,260	4	7,000	33,760.00	63,925.03
9	2.1	192,477	13	2,309,811	30,368	14	8,451.52	650	00	2,505	4	50	1,272.50	210	23	4,830.00	5,260	4	7,000	67,935.00	67,935.00
10	2.1	53,863	12	6,463,536	16,543	30	2,909.13	700	00	198	4	50	891.00	50	5	250.00	5,260	5	7,500	35,399.90	35,399.90
11	2.1	15,673	13	3,071,681	14,377	30	1,437.60	500	00	138	4	50	691.00	50	5	250.00	5,260	5	7,500	30,360.00	46,464.91
12	2.1	115,473	11	1,270,203	14,377	30	1,437.60	500	00	138	4	50	691.00	50	5	250.00	5,260	5	7,500	30,360.00	46,464.91
13	2.23	19,813	10	1,981,300	721	12	86.52	500	00	9,253	5	50	46,625.50	768	5	2,500.00	5,260	5	7,500	32,378.50	50,063.52
27.09	971.965			\$78,951.97	10.336		\$14,749.82	\$3,440.00	9,253			\$46,625.50	768		\$19,630.00	71,317			\$299,376.50	\$460,483.39	\$460,483.39

## FOURTH DIVISION—From Paoli to Fredericksburg.

No. of Length Section	EXCAVATION— Cubic			EMBANKMENT— to each perch yard			CLEARING and BRIDGING			MASONRY in perches of 22 per.			BRIDGING— in local feet			METAL COVERING in perches of 22 per.			TOTAL COST.
	No. of yards	Price Amount.	No.	No. of yards	Price Amount.	No.	No. of perches	Price Amount.	No. of perches	Price Amount.	No. of perches	Price Amount.	No. of perches	Price Amount.	No. of perches	Price Amount.			
1	1.77	28,616	15	429,240	12,438	11	139,788	400	00	287	4	1,336	50	4,673	1	6,512	20	13,909	62
2	2	14,938	12	212,456	10,17	12	129,048	475	00	439	4	500	50	5,200	1	4,413	00	17,703	62
3	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	50
4	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
5	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
6	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
7	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
8	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
9	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
10	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
11	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
12	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
13	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
14	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
15	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
16	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
17	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
18	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
19	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
20	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
21	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
22	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
23	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
24	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
25	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
26	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
27	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
28	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
29	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
30	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
31	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
32	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
33	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
34	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
35	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
36	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
37	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
38	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
39	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
40	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
41	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
42	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
43	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
44	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
45	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
46	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
47	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
48	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
49	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
50	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
51	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
52	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
53	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
54	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
55	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
56	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
57	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
58	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
59	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
60	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
61	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
62	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
63	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
64	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
65	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
66	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
67	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
68	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
69	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
70	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
71	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13,500	72
72	2	14,976	10	149,760	12,931	15	1,847	50	00	99	4	445	50	5,200	1	4,413	00	13	



5	2.	16,309	10	1,6
6	2.	14,976	10	1,
7	2.	19,763	10	1,976

Cubic yards

12  
**H. R.**

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**REPORT**

OF THE

**COMMISSIONERS OF THE WABASH AND ERIE CANAL.**

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DECEMBER 19, 1835.

Read and referred to the committee on Canals and Internal Improvements, and  
1200 copies ordered to be printed.

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To the General Assembly  
of the state of Indiana:

In pursuance of the duties enjoined by law, the undersigned respectfully beg leave to report: that so soon as the season would permit they took measures to relet, and make such disposition of that portion of the Wabash and Erie Canal which lies between Huntington and the River Aboite as was necessary to complete the same by the 4th of July last. This part of the line lies along the margin of wet prairies on the borders of Little River and was about fourteen miles in length. From its peculiar situation it was sickly; and from the experience of the last year's operations it was apparent that after the warm weather would set in of July and August it would be difficult if not impossible to have this part of the Canal worked with a competent number of laborers without much sickness and great loss of human lives. The measures taken, were sufficient for the purpose intended; the middle division was finished in the time contemplated, the canal filled with water and on the 3d and 4th of July navigated with boats through the whole length of this division of thirty-two miles. That part of the line from Huntington to Aboite had been taken at prices too low for the contractors to finish without loss; and from the sickness of the last year, the high prices of provisions, and the bad reputation it had acquired from re-lettings, was necessarily finished at more cost than was anticipated when the work was first estimated.

The middle division or summit section of the canal which was finished in July last embraces the high dam across the St. Joseph's river, one guard and four lift-locks. For want of better materials the first three of these locks are built of wood, the

fourth is a combined lock made of hammer-dressed stone laid in dry wall, and faced with plank so as to be perfectly tight between the walls. It has been a matter of much regret, that wood should have to be used for structures of this description on account of their liability to decay. Much exertion was used, and many examinations made with the hope of finding suitable building stone in the vicinity of these locks but without success. During the summer some few breaches occurred in the canal banks on the St. Joseph's feeder-bluffs, and one near Mill creek on the main line. A rain said to be unprecedented in violence, filled the canal at this point faster than its capacity would permit such an accumulation of waters to be discharged broke over the banks and did considerable damage.

This took place previous to the first of July, at which time the middle division was completed. Since then the navigation of these thirty-two miles has not been interrupted for a single day. From the feeder-dam to the first lock is a level of twenty miles in length. Filling this and other portions of the line with water tested the perfect accuracy of the engineers in its formation. No deviation from their original plan is any where perceptible and the whole work reflects credit on the skill and judgment of the engineers who have planned and superintended its construction.

This division has been completed and kept in repair to the present time for the sum of \$227,786 84, being \$8,163 16 less than the estimate made for it by Joseph Ridgeway jr. in 1830, and an average cost of \$7,177 00 per mile.

It was the wish of the board to have put under contract that part of the canal line, from near Miamisport to Georgetown, a distance of 21 miles, early in the spring. But an unusual scarcity of provisions not only on the line but generally over the state, with the high prices at which the re-lettings above Huntington were taken, induced them to postpone the matter until the 15th of September last. Including the amount of work which was re let above Huntington there must have been about \$400,000 worth of work under contract the first of April last, on account of the high prices of provisions, if the line from Miamisport to Georgetown had then been let; by drawing supplies and labor to that quarter, the contractors on the old line would have been compelled to have abandoned their contracts.

That part of the line which was re-let in the spring was taken at more than double the rates for which they had been contracted for at the first letting. The prices for plain earth excavation when first put under contract, was generally from 9 to 9½ cents per cubic yard. The same work was re-let in the spring at prices varying from 18 to 22 cents per yard. From Huntington westwardly the contractors had their work generally for earth excavation from 10 to 12½ cents per cubic yard, and have nearly finished it at those prices. The amount was large, and if they had been forced to abandon their work in the spring. under the circumstances which then existed, the new contracts could not have been made for less than 50 per cent on the prices for which this part of the line has been finished. The amount of the old contracts was nearly, as before remarked, \$400,000 in the spring, and not less than one-fifth of this work would have been re let, and would necessarily have cost the state from \$35 to 40,000 more than the amount for which it has been, and will be finished.

Whenever a portion of canal line is put under contract, experience fully proves that laborers who are at work on the old line, leave it in great numbers for the new one. Persons who sell provisions pursue the same course, and in case the line which was let in September, had been put under contract in the spring, the contractors on the old line could not have finished their work; they would have been compelled to abandon their contracts, however unwilling, have suffered ruinous losses, and the work which is now finished, have cost beyond the prices



which have been paid for it, a large amount. According to the terms of the contracts, the line westwardly from Huntington which was let last year, in May and July, should have been finished by the 10th of November last. Two of the dams across the Wabash river, at Huntington, and Lagro have been finished in a very satisfactory manner, and the third one below the mouth of the Mississinawa is in a great state of forwardness and left it is believed in a safe condition. The earth work on this part of the line is very nearly completed. In most instances where wooden or combined locks were contemplated, the plans have been changed and hewn stone substituted in their stead. By much labor in making examinations, several quarries of excellent stone have been found, and whenever it could be done within any reasonable expense the board have not hesitated in making the change. From Huntington westwardly to the termination of the canal lettings in 1834, there will be four wooden and eight hewn stone locks. Below this point stone of a suitable quality can be obtained to build all the structures which may be necessary, and avoid the use of perishable materials. The change from the original plan to cut stone has delayed the construction of these locks; they now constitute much the largest part of the unfinished work on this part of the line. With some effort they can be completed and the canal filled with water to within 15 miles of Logansport by the 1st of July next.

The operations on the Canal have been as successful during the last year as was anticipated, notwithstanding the scarcity of provisions and the sickness of the season, which to a greater or less degree prevailed over many parts of the state. Along the line it was unusually healthy, and the amount of labor done in constructing the Canal during the present year, is more than twice the amount done during the last, and affords a flattering prospect for the speedy and successful completion of the whole work.

For specific detail of the operations on the Wabash and Erie Canal, reference is respectfully made to the report of Mr. Williams, Engineer in chief, which is appended to this communication and marked No. 1.

The last session of the Legislature directed surveys of Canal routes on many of the leading natural canals for internal improvements in this state. Early in the spring and during the latter part of the winter, negotiations were set on foot to procure competent Engineers for this service. From the arrangements which were made with Mr. Gooding last winter, his services were procured at the opening of the spring. A party was then placed under his command and sent to make a survey south from Indianapolis, with the view of locating a Canal line from that point to the Driftwood fork of White River, thence to the valley of the Muscatatack, across it and Collins Gap in the Knobs, to the waters of Silver Creek, and thence to Jeffersonville and around the Falls of the Ohio. This work, although practicable, and evidently of the highest utility provided it should have been made, was considered too expensive under the present exigencies of the state, and after pursuing the surveys until it was ascertained that a Canal in that quarter would cost thirty thousand dollars per mile between Indianapolis and Jeffersonville, it was given up under the belief, that a Rail Road, where so many natural impediments have to be encountered, would possibly be the cheaper improvement, and the best calculated, under such circumstances, to advance the interests of the

state. The Board felt the importance of this survey, and made many examinations in relation to it. The Falls of the Ohio is the natural point for the trade of a large portion of our state, and if this work could have been constructed by introducing the water on the highest ground between Jeffersonville and Albany, keeping above the solid rock, and locking down into the river each way, a safe steam boat navigation around the Falls, free from the washings and deposits of river floods, might have been made and kept in repair at very small cost. Such a work could not fail of affording profits, as the annually increasing business of the Ohio will in a very short time swell to so great an amount, that the Canal on the Kentucky side of the river, will be entirely inadequate to pass the commerce of the country.

The waters of Driftwood are sufficiently elevated and abundant to pass Collins' Gap, and supply the line below. But from the peculiar formation of the valley of Muscatatack, it is rendered difficult and expensive. This valley has little or no fall, until it meets the hills and mountain country which bounds its limits. Contrary to most river vallies from the streams to the hills; there is little or no inclined plane. In carrying the Canal around the upper section of the valley, a succession of mountain points projecting into it, with deep ravines between them, had to be encountered, which swelled the cost to the amount before stated. The greater regret was felt from the conviction, that in time the resources and wants of the country will induce the construction of this work, and from the fact that the country through which it passes is rich in Iron Ore, probably Coal, and in the event of a public work being made in that quarter, would become the rich mineral district of the state.

From the great amount of public works which the different states have been engaged in the present year, it was difficult to procure Engineers to make the surveys. The Board, however, succeeded in procuring the services of Francis Cleaveland of Ohio, and C. T. Whippo of Pennsylvania, who were placed at the head of the locating parties, the former on that portion of the central Canal lying between Indianapolis and Evansville, and the latter on the Wabash and Erie Canal, from Lafayette to Terre Haute. Messrs. Gooding, Cleaveland, and Whippo, are among the most efficient Engineers in the United States, and have superintended the construction of long portions of Canal lines in New York, Pennsylvania and Ohio. Mr. Gooding took charge of the routes north of Indianapolis to the Wabash and Erie Canal. All of these gentlemen have had much experience, have spent the greater part or all of the last ten years in the construction of Canals, are perfectly acquainted with their profession, and from their thorough acquaintance with every thing connected with the subject, the manner of making public works, and the effects produced by them, the most implicit confidence may be placed in the estimates and reports they have presented. It has been the object of the board to engage the services of the best Engineers in the country, and to have none in the employ of the state but men of acknowledged reputation,

thoroughly acquainted with their profession. From being fully convinced that nothing in point of economy and prudence would compensate the evils which would result from placing the superintendence of the projected works in other than the best hands, as regards plan, manner and cost of construction, as well as their usefulness and durability when built, they are flattered in believing that they have been fortunate in procuring such selection, and feel much pleasure in being able to point to extensive and important works constructed by these gentlemen in several of the states, in the best manner, as practical proofs of the reputation they sustain.

In the progress of the surveys they have used untiring industry, and have encountered severe labors under discouraging circumstances and distressing sickness, occasioned by the hardships and exposures which the nature of their services necessarily imposed.

That portion of the Wabash and Erie Canal lying between Fort Wayne and the state line, has been located in a very satisfactory manner by L. B. Wilson, Esq. acting under the general direction of the Chief Engineer.

To aid in the location of the several Canal routes, directions were given to the Engineer in Chief, to organize a random level party, whose business it should be to ascertain in advance of the locating parties, the comparative height of difficult points on each route, and of the several summits and the streams from which a supply of water must be drawn. This party commenced operations as early as the season would permit, and has carried a level on the proposed Canal routes from Indianapolis to the Driftwood and Muscatatack rivers, thence to the waters of Silver Creek and to Jeffersonville; from Indianapolis across the various summits to Evansville; and in various directions north of Indianapolis, with the view of ascertaining the proper point of junction of the centre with the Wabash and Erie Canal; and to have that connection made as far eastwardly as the formation of the country would permit. Levels were run from Indianapolis up Fall Creek, White River, Pipe Creek and the Mississinawa, by Pendleton, Andersontown, Muncietown and Marion. And from Muncietown and the Mississinawa as far as was necessary to determine the practicability of such junction of the two Canals towards Fort Wayne, Huntington, Lagro, Wabash, and the mouth of the Mississinawa; and with the view of ascertaining the practicability of a Canal across a large district of the southern portion of this state, a line of levels was also run along the summit country dividing the waters of White River and the Ohio, from Princeton in Gibson county, to Collins' Gap, near Vienna in Scott county. These random lines have been mostly run by a party under the charge of Anderson Davis, who has performed this service with great ability. The surveys have been made under the immediate control of the Engineer in Chief, have been of great advantage in the location of the several Canal routes, and connected with similar ones made by Col. Stansbury, chief of the Rail Road Engineers, have been



the means of obtaining correct topographical knowledge of the greatest part of the state.

For details of the surveys which have been made during the present year, under the directions of the Canal Board, reference is respectfully made to the reports of the Engineer in Chief, and Messrs. Wilson, Gooding, Cleaveland and Whippo, which are hereunto appended and numbered from 2 to 6, as part of our annual communication.

From the examination of these reports it will be perceived that Canal lines have been surveyed and estimated, from Fort Wayne to the Ohio state line; from the Wabash and Erie Canal, through the counties of Wabash, Grant, Delaware, Madison and Marion, to Indianapolis; thence south through Marion, Jonson, Morgan, Munroe, Owen, Greene, Daviess, Pike, Gibson and Vanderburgh counties, to Evansville on the Ohio River. A Canal route on the border of the Wabash from Lafayette to Terre Haute, and also a cross cut Canal from Terre Haute to the centre Canal at the mouth of Eel River, near the dividing line of Owen and Green counties. Although this last route was not authorized by law, the country appeared so favorable for such purpose, and the object of so much importance in forming a general plan for the improvement of the state, that the facts of the case were submitted to the Executive, who held the same views in relation to its importance, and advised that a survey should be made. Inasmuch as the labor could be performed while the locating party was in the field, for half the expense that must necessarily be incurred to make the examinations after they were dismissed, so soon as the location of the line had been finished to Evansville, Anderson Davis, under the general directions of Mr. Cleaveland, proceeded to locate and estimate this line. The length of this route is 44 miles, and connects in a very good direction, the Wabash and Erie with the Centre Canal; so that the latter, from the mouth of Eel River will be the outlet of both works to the Ohio.

That such a formation of country should be found that would allow a Canal to be carried across the summit ridges between the Wabash and the White Rivers, between White River and the Patoka, and between the latter and the Ohio, is at least extraordinary and almost without a parallel. The advantages which will accrue to the state from this termination of the Wabash and Erie Canal, will be found in diminishing the length of that work, to the Ohio river, which will be much less than could be obtained by extending it down the immediate valley of the Wabash, in bringing a great commercial thoroughfare from the border into the interior of the state, and terminating it at Evansville on the Ohio, which is well situated to command the trade of an extensive fertile country and become a large commercial town. The formation of the country north of Indianapolis is equally well adapted for a connection between the vallies of the White River, Mississinawa and Wabash Rivers. A Canal route from Indianapolis to the Wabash and Erie Canal can be easily made; it can be taken to the Mississinawa by any one of several routes, and from

thence may be connected with the Wabash and Erie Canal, either by following the Mississinawa to its mouth, or by carrying it across the point of land between the Wabash and Mississinawa Rivers, and forming the junction of the two Canals near the town of Wabash.

From the fortunate circumstances in the physical formation of the country, this state is as susceptible of improvement with small expense as any one in the Union. The singular facts of being able to cross the ridges dividing the waters of so many streams in natural depressions would apparently indicate that those channels were formed for the construction of Canals to accommodate the transportation of the bulky products of a fertile grain growing country.

From an inspection of the location of the Canal routes on the map of Indiana, it will be seen that a Canal can be made, from the Wabash and Erie Canal nearly in the centre of the state, to Indianapolis; and that it approaches at Muncietown and Andersonstown, within from 25 to 40 miles of the White Water Canal. To render the plan perfect for the improvement of the state, it is respectfully suggested that a connection either by Rail Road or Canal between these works be made. If the formation of the country will permit, a Canal will be the best mode of connection; so that boats can pass from one route to the other and avoid the necessity of transshipment of freight. Without pretending to any personal knowledge of the country, but relying on the map alone it is believed that a Canal route may be found practicable, from some point near Milton, or between that and Connersville, to pass near or a short distance north of New Castle in Henry county, and thence to the Centre Canal, near Andersonstown or Muncietown, as may be found best; and thus unite the two works in a good general direction, without increasing the distance from the White Water to the Wabash and Erie Canal. Such a work between the two Canals would have necessarily to depend on artificial reservoirs for its supply of water, and by locating it as far south of the ridge which divides the streams falling into the two White Rivers, as New Castle and Andersonstown, its means for a competent supply would be greatly increased and probably obtained. At this time the state has several eminent Engineers in her employ, and as the importance of a connection between these works is so obvious, the propriety of having authority granted to have a route surveyed and located, for a Canal if practicable, or a Rail Road if it should prove otherwise, is respectfully submitted.

With a connection between these works, commercial channels would be formed from the Wabash and Erie Canal, through the White Water country to the Ohio at Lawrenceburgh, and open the trade of the Pennsylvania Canals of Pittsburgh, of Cincinnati and the Ohio river, into the interior of our state. The Centre route would leave the Wabash and Erie Canal at nearly right angles, and pass through the valley of White River, in the richest and central part of the state, to the Ohio at Evansville; would float off and bring in the immense amount of annual export and import of this extensive country, abound-

ing in agricultural and mineral wealth; while the Wabash and Erie Canal, taken down that river to Terre Haute, and thence connected with the Centre route in Greene county, would afford to the western part of the state, the facilities to its commerce, which the fertility of the country, its great trade, and dense population demand. At a time when the public mind appears to be so much occupied in devising a plan for public works the best adapted to the interests of the state, it may not be improper to invite attention to these three; Eastern, Centre, and Western Canal routes, as constituting the great natural outlines of the first plans for the improvements best suited to a fertile grain growing country; and although the undersigned are far from believing that these Canals are the only works which the state should construct, they are clearly of opinion, they should hold the first place in the system which will be ultimately found best for the great interests of the country to adopt.

There is probably no where to be found a more productive country, than that part of Indiana through which these Canals are located. In point of fertility of soil, the lands for many miles in their vicinity, are unsurpassed, and for many years to come, the business of its inhabitants must be agriculture and the pursuits connected with it. For such a country there can be no better way of subserving its interests, than by forming for it the means of cheap and easy conveyance of its productions to market. As commercial channels, the cheapness of freights on Canals, render them the best mode of internal improvement for an agricultural people. They are made, kept in repair and navigated, by the common labor and means of a country; their uses are general, and open to the competition of community; as the expense of horses and boats are within the means of persons of moderate capital; the moneys paid for freights are widely diffused, and returned often in exchanges among the people; they enliven and give a greater degree of activity to the business of a country than can be done by any other kind of public improvement. They add to the resources of a country by the water power they create, the manufactories they are the means of introducing, and the various kinds of employment, business and occupations, which the creation of a large amount of permanent water power in places where it can be used to the best advantage, cannot fail to produce.

On the Centre Canal, from near Andersontown to Evansville, the water power which will be created at the locks only, will be sufficient to propel 618 pair of 4½ feet mill stones; and at Indianapolis a quantity for manufacturing purposes, enough to drive twenty pair, and at the dams between the two points, more than two hundred run of the same sized mill stones. On the Ohio Canals, the water power is readily leased for a term of years, at an annual rent of \$150 per run of stone, and although in many places the country near the Canals is well supplied with mill privileges, the water power on the Canal is eagerly sought on account of its stability, perfect controul, superior advantages of market, and facilities of receiving and sending off their



raw materials and manufactured articles. Admitting that within five years after the completion of this Canal, one fourth of this quantity should be brought into use for prices equal to those in Ohio, the annual rent would be \$31,425; if one half in ten years, \$62,850; three fourths in 15 years, \$94,275; and if all should be used in twenty years, it would yield an annual revenue of \$125,700; which would then be a sufficient sum to pay for all the repairs which this line would require. The amount of rents, however, is but a small portion of the advantages which would be derived from this water power; these would be found in the erection of mills, in the establishment of manufactories, in the various employments which it would call into action, in the increase of wealth, the importations, exportations, and business of the country; which of themselves are of so much importance to its interests, that no ordinary consideration would compensate for their loss.

The section of country adjoining the southern part of the Central Canal, is supplied with extensive beds of good Coal, which appear inexhaustible, and abounds with many indications of Iron Ore, which from the specimens that are scattered in the ravines and beds of streams, warrants the belief that for richness and quantity, the supply will be sufficient for the manufacturing demands of the state. The trade in coal from this quarter to other parts of the state, where it is not found, will, in a few years, be of vast amount. A canal from its cheapness of freights would accommodate this trade better than any other mode of improvement; and in the manufacture of iron, where heavy water power is so essential to keep in motion the heavy machinery necessarily used for converting the ore from its raw state into the various articles for which it is used, would be almost indispensable for its success.

The advantage of having a continuous navigation from Lake Erie to the Ohio river, will at once be perceived. And the fact of being able to maintain so long a line without the cost, expense of time, and liability of derangement in the transmission of freights, which a change from canals to rail roads would necessarily produce; will give this work a decided advantage in carrying the merchandize from the eastern cities, to the states south and west of us, which will in a short time seek this route as the channel best suited for the convenience of this trade.

The reasons which urge the construction of the Wabash and Erie, and Central Canals, apply with as much force to the Whitewater: the same advantages would result, and the same benefits be derived.

The advantages of a canal navigation through the eastern, centre, and western divisions of the state, can hardly be appreciated in unfolding its resources, enhancing its wealth, and producing a general state of prosperity. From the great fertility of the country through which they would pass, they could not fail of becoming profitable in the receipt of tolls; and in a few years after they were completed, would amply repay the cost of their construction.

For a country so strictly agricultural, and situated as ours, there is no hesitation in the minds of the Board as to the utility of constructing

these three canals in preference to any other kind of improvement, for the district of country through which they pass. They feel this opinion sustained by the practice of Ohio, New York, and Pennsylvania especially of the two latter; where they have had much experience and have made many canals and rail roads. The policy pursued by these states, is doubtless the true one; in making canals where the business to be done on them is mostly for the transportation of freights, especially the bulky productions of the soil, and where they can be supplied with water without difficulty, and in making rail roads between places where the travel of passengers is great, and in sections of country, which from their formation, will not admit of canals.

The cost and length of the several main lines of canal routes as they have been located and estimated during the past season, are viz:

### THE WABASH AND ERIE CANAL.

	Miles.	Chains.	Estimate	Average per mile.
From Fort Wayne to Ohio state line	19	30	\$154,113.13	\$7,952.17
“ Lafoyetto “ Terre-Haute	90	00	1,067,914.70	11,865.79
“ Terre-Haute to Central canal	43	40	629,631.65	13,540.46

### CENTRAL CANAL.

	M.	C.	Estim.	Av. pr. m.
From Indianapolis to Evansville	194	00	\$2,400,947.70	\$12,376.02
“ “ to W. and Erie } canal at Wabash, including 13 miles 3 chs. navigable feeder. }	103	34	1,992,224.54	17,106.51
Total by this route, 297 miles, 34 chains long, cost				\$4,393,172.24.

	M.	C.	Estim.	Av. pr. m.
From Indianapolis to W. & E. Canal at mouth of Mississinewa	114	46	\$1,897,797.19	\$14,871.75
Total via the mouth of Mississinewa	308	miles, 46 chains,	cost \$4,298,744.89.	

Difference in the two routes 11 miles, 12 chs. cost \$94,427.35.

On the route North of Indianapolis it was the intention of the Board to have had a minute survey made of the Fall creek route, which service they will endeavour to have performed as soon as the weather will admit. A Canal route in that direction would be cheaper than by White River and some miles shorter provided an available supply of water can be obtained.

It should be remarked that the estimates presented on each route are intended by the several Engineers to cover the cost of permanent and substantial stone work. On many of the public works in the country the first estimates have proved only sufficient to complete them in an imperfect and temporary manner; in consequence of which large additional expenditures have been required for repairs or changes of plan be-



fore the improvements would answer the purposes for which they were designed. No such result can be apprehended in regard to these canals. The principles and rules adopted for ascertaining the quantities of the several kinds of work are such as cannot fail to produce a quantity sufficiently large, and in estimating the various structures very little timber or other perishable materials has been calculated.

On the whole extent of canal estimated there will be 111 lift locks if the Pipe creek route between White River and the Mississinawa be adopted, all of which except 16 have been estimated of cut stone masonry. The only perishable materials which will require to be replaced consists of the crib work of the 16 wooden locks and a few culverts.

For the next year's operations it will be desirable to have that part of the Wabash and Erie canal from Georgetown to Lafayette put under contract during the season, and as this portion of the line embraces some of the heaviest work on the whole length of the canal, and which will require two years or longer for its completion. Unless more unfavourable causes should operate against such measure, than there is now reason to apprehend, this heavy work should be let early in the spring; and the remainder of this line put under contract in time to give the contractors employment so soon as they will have finished the work which was let in 1834. That part of the canal which lies between Fort Wayne and the Ohio state line should also be put under contract soon enough to have it ready for use, as early as the completion of that part which lies in Ohio shall render it available for navigation to the lake. The construction of the Ohio part of the Wabash and Erie canal has evidently been delayed in consequence of the conflicting interests of Ohio and Michigan in regard to the disputed territory bordering the mouth of the Maumee river; and as that question will be probably settled by Congress during its present session on the admission of Michigan into the union, it is to be hoped that after the decision of this question the state of Ohio will speedily complete this work and open the canal to the lake. In order to reap the advantages, which will result from that event, the propriety of having authority granted to put it under contract whenever any definite action by Ohio shall warrant the measure is respectfully suggested.

The Board of public works in New York under legislative authority have decided on enlarging the Erie canal to 7 feet depth and 70 feet width so as to admit a greater amount of business to be done on it; as experience has fully proved that its present size is insufficient for the annually increasing commerce of the country. If the central canal should be constructed, the White Water connected with it, and the Wabash and Erie canal extended to the Ohio river, from the great fertility of the country, and the immense amount of freights which in a few years must necessarily be transported on it, the same results may be apprehended on the eastern division of the Wabash and Erie canal, and as it would cost much less to construct a canal of sufficient capacity in the first place than it will to enlarge it after it is made the propriety of having that part of the canal lying between Fort Wayne and the Ohio state line increased in size, provided Ohio can be prevailed on to



enlarge her part of the line has been a subject of some reflection with the board and is submitted with the view of inviting that attention to the subject which its merits may demand.

If the deliberations of the present session of the General Assembly should result in the adoption of a general system of internal improvements and the canals be authorized in the three grand divisions of the state it will doubtless be the true policy to construct these works as fast as a prudent regard to economy will permit, and have as much going forward in the different parts of the state as can be put under contract at the same time, without raising the demand for labour and provisions to such an extent as would render the construction of the works too expensive.

The first great object to attain should be to have the Wabash and Erie canal finished from the lake to the cultivated part of the country on the Wabash river, but at the same time that this work is progressing there could be no reasonable objection against the carrying on the White Water, and the Southern portion of the central canal. Those places are at such a distance from each other that they would not interfere, in regard to labour and provisions, and would have the advantage of expediting the completion of the public works and equalizing the benefits derived from disbursing large sums of money in a more general manner over the state.

From past experience we are led to perceive that in commencing any new work, considerable time is required to procure the necessary artificers, tools, and materials, to carry it on and that so many preparatory measures have to be taken that the amount of money disbursed the first year on any new work must be small.

If these works should be commenced, the sum of one hundred and twenty five thousand dollars for the White Water, and seventy five thousand dollars for the central canal, would probably be as much as the first year's operations would require.

The amount of work on the Wabash and Erie canal for the current year has been more than \$300,000 and twice as much as was done during the last; each year produces an increase of means for carrying on the work, which in the nature of things must continue until the whole shall be completed.

For the operations of the next year on the Wabash and Erie canal about the sum of five hundred thousand dollars should be provided; believing however that the best interests of our public works will be more effectually served by authorizing the fund commissioners to contract for loans at any time, and to any amount, which the favorable state of the money market and the most advantageous prosecution of our works may warrant; we hope that it will not be considered as traveling beyond the pale of our duties, if we remark that in the states where they have had the most success in the construction of public works, they have constituted boards of internal improvements; have given them discretion to place under contract at such times, and power to make such changes on any line of canal or Rail Road as the public good required; have given authority for loans to be made suf-

ficient to complete any work they may have authorized, or in other words in giving legislative sanction for the canals or Rail Roads which they have constructed.

They have made all the legislation at once which was necessary to carry them into effect or complete them, in order to give their progress stability and success.

In presenting the estimates of these canal routes it is proper to state, that the surveys determine fully their entire practicability, but before they are prepared for construction more minute examinations will have to be made which will doubtless show the necessity of minor changes in the location of the several lines, which will either shorten their distance or cheapen their cost. The engineers employed during the season have done an immense amount of labour, and have obtained all the facts which are necessary for determining the general plan of these works. And we must here be permitted to repeat our obligations to J. L. Williams, engineer in chief, for the valuable assistance he has rendered in devising the manner of our operations, and his services in the performance of the various duties connected with the station he fills, which have all been of the most satisfactory character and give additional evidence of his untiring industry and zeal to promote the interests of the state.

The great amount of labour and the wide field over which our operations have been extended during the last year, has prevented the return of our receipts and accounts. A detail of the monied transactions of the year is therefore omitted and will in a short time be made the subject of a special report.

All of which is respectfully submitted,

D. BURR,	} <i>Commissioners of the Wabash and Erie Canal</i>
SAML. LEWIS,	
J. B. JOHNSON,	

*Indianapolis, Dec. 19, 1835.*

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*To the Board of Canal Commissioners:*

GENTLEMEN—

That portion of the Wabash and Erie Canal, extending from the head of the St. Joseph's Feeder to a point near the mouth of Little River, generally termed the Middle Division, having been completed and filled with water, the undersigned deems it proper to present a description, somewhat in detail, of the various mechanical structures which have been erected, in order that those on whom the care of superintending, preserving, and repairing the Canal, will hereafter devolve, may be put in possession of the requisite information. And with a view to the same object, accurate drawings of the most important works, have been made and are herewith submitted.

The mechanical structures on this line, consist of the St. Joseph Dam, one Guard Lock at the head of the Feeder, which serves at once to regulate the flow of water and to connect the navigation of the St. Joseph with the canal; four Lift Locks, overcoming a total ascent of 35 feet; five small Aqueducts; nineteen Culverts; one framed Waste Weir, and six Road Bridges.

The want of building stone on this division, has involved the necessity of using timber in the construction of most of these works. But the foundations of such as are subject to decay, have been so formed as to receive a stone superstructure, when the time for re-building them shall come. The opening of the Canal to the fine quarries on the Wabash, will afford the means of bringing the stone to the point where they may be required, at a moderate cost, and by having the materials properly prepared, permanent stone structures may be substituted for the perishable ones, with but little interruption to navigation.

The St. Joseph Dam, upon which the practicability and success of the canal wholly depends, has been from necessity constructed at a point where the bed of the river is composed entirely of sand. The foundation of the Dam, to the height of seven feet, has been formed of unhewn trees 50 to 70 feet in length, laid with the current, the tops being placed up stream, and the whole resting on a layer of fine brush. The upper layers of trees are drawn back so that their lower ends present a succession of benches or platforms, which form a substantial apron to receive the descending floods. On this foundation of brush and trees, a crib has been erected 10 feet high with 40 feet base, sloping on both sides, filled with stone and covered with 6 inch plank. The Dam is made completely water tight by a bank of gravel and sand (the coarsest material that could be obtained) placed above the crib 45 feet wide on the top and about 75 feet at the base. To prevent this gravel from being removed by the floods, its whole upper surface has been covered with stone and brush. A quantity of large round stone gathered from the bed of the river, or found in excavating the canal, has also been placed below the Dam as an extension of the apron. The whole base of the Dam, including apron and gravelling, is about 170 feet; its height from low water  $15\frac{1}{2}$  feet, and from bed of river 17 feet; and its length between abutments 230 feet. The abutments are formed of hewn timber put together in the form of cribs, and filled with gravel; they are 110 feet in length, 20 feet in width and 25 feet in height. The whole cost of this Dam, including the expenditure made by the superintendant in repairing and securing up to the 30th November last, is \$15,397.

In my report of 6th December, 1833, the belief was expressed that stone suitable for combined Locks could be found in the vicinity where most of the Locks were located, but this anticipation has not been fully realized. After much examination, stone of an inferior quality was obtained in the vicinity of Huntington sufficient for the walls of one lock and the abutments of two small aqueducts.

Locks No. 1, 2 and 3, together with the Guard Lock, have been constructed entirely of timber, but will doubtless be replaced with cut



stone when the timber shall decay. Lock No. 4 has been built of stone and wood combined—the walls being formed of dry masonry and of sufficient strength to resist the pressure of the adjoining embankment, and made water tight on the face by a double lining of plank secured by iron rods. For Locks Nos. 2, 3, and 4, a solid rock foundation was obtained—the other Locks rest on a sand or clay foundation made secure by a platform of hewn timber covered with three inch plank. The aqueduct trunks are all formed of timber. The abutments for the Bull creek and Flint creek aqueducts, are of hammer dressed masonry. Those at Aboite, Spy run and Becket's run, are built of timber. Flint creek aqueduct rests on a solid rock bottom. All the other aqueducts are built on sand or gravel bottom, but are made secure by a platform of hewn timber extending over the whole space between the abutments as well as under them.

For streams not larger than these, culverts should generally be preferred to aqueducts, where suitable materials can be found for their construction, and where the level is sufficiently high to admit of that form of structure. And as these works will probably be re-built with stone, the propriety of changing the form of the structure at Spy run and Becket's run, from an aqueduct to an arched culvert, is here suggested. At the other streams above named, the level is so low as to make an aqueduct with a wooden trunk the most suitable structure, inasmuch as less space is required for this than for an arch.

Of the culverts on this division, 14 have been so constructed as to be at all times submerged in water, and may therefore be considered no less durable than if built of stone. The remaining five are partly exposed to the air, and will, except the foundations, be subject to decay.

The Waste Weir at Marias Du Perches is so constructed that only the frame work will decay—the foundation being below water. This structure is 150 feet long and has ten sliding gates  $3\frac{1}{2}$  feet square, which are hoisted in time of floods. It is designed principally for the passage of the stream near which it is located, but will also answer a valuable purpose in discharging the surplus water of the summit level which may collect from other sources.

The bridges have been built two feet higher than those on most other canals in the country, so that they will interfere but little with the convenience of passengers.

The outer slope of the emdankment at the St. Joseph Bluff, has been protected from the abrasion of the river by means of brush connected with the bank, according to the original plan. But this protection, though sufficient for a few years, will soon decay, and its place must be supplied with stone, which can now be cheaply obtained by the Canal.

The total cost of this division of the Canal, including all repairs up to the 30th Nov. last, and including also the sum of \$2,000 for graveling the towing path, and for other small items of work not yet completed, may be stated as follows, to wit:

The St. Joseph's Feeder, 6 miles 34 chs. including Dam,	\$70,367 57
Main line from mouth of Feeder to lower end of section 50, near mouth of Little River, 25 miles 25 chs.,	142,419 27
	<hr/>
Total, 31 miles 59 chains,	\$212,786 84
Add superintendance and incidental expenses, as nearly as can be separated from other charges,	15,000 00
	<hr/>
Total,	\$227,786 84

Which gives an average of \$7,177 00, nearly, per mile, including all expenses. During the past season, the work on that portion of the line, extending from the mouth of Little River to Lafountain's creek, has progressed with a degree of energy and uniform success, which, considering the high prices that have been paid for provisions and labor, is highly creditable to the contractors. Thirty-five sections, amounting in all to 17 miles 59 chains have been completed and received; five others amounting to 2 miles 45 chains require little more than the trimming of the banks to finish them, and the remaining thirty-two sections are generally in a forward state.

Dam No. 1, situated half a mile below the mouth of Little River, and Dam No. 2, half a mile below the mouth of Salamonina, have been completed. The most difficult part of the foundation of Dam No. 3, below the mouth of the Mississinewa, has been laid and secured; the abutments nearly completed, and the materials for the body of the Dam prepared. All these Dams, excepting about half of the one last named, are built upon a solid rock foundation, and from the care taken in constructing them, great confidence is felt in their durability.

Less progress has been made in the construction of Locks than any other part of the work on this portion of the line. Four of the Locks, have, however, been nearly completed; the foundations of four others are placed, and materials for the remaining six partly prepared.

It is a matter highly interesting to the State, that within the last season excellent lime-stone quarries have been discovered convenient to the line, where from previous examinations it was supposed that the Locks would necessarily be constructed of less durable materials. All the Locks within reach of these quarries, are now being constructed of cut stone masonry. And although the change of plan has caused some delay and will increase the cost of the work, yet the interests of the State must be greatly promoted thereby. Further experience and observation have confirmed the correctness of the opinion heretofore expressed, that cut stone Locks are in the end most economical, though the first cost may be much greater. If the quarries which have been discovered should equal present anticipations, fourteen of the twenty-three Locks between Fort Wayne and Georgetown will be built of cut stone masonry; one of stone and wood combined, and the remaining eight entirely of wood.

The whole length of the line from section 50, near the mouth of Little River to section 122, near Lafountain's creek, is 35 miles 30+

chains, and if finished under existing contracts will cost the sum of \$460,838 00, making an average cost of \$13,024 nearly, including superintendence.

On the line which was put under contract in September last, extending from section 122 to section 163, near Georgetown, operations have been commenced and are now progressing. This subdivision is 20 miles and 66 chains in length, embracing six Locks, and one Aqueduct over Eel river, and will cost, if completed, under existing contracts, near the sum of \$244,843, averaging \$11,758 per mile.

The three sections east of the Middle Division, extending from the mouth of the St. Joseph's Feeder across the St. Mary's river, and through Fort Wayne to the junction of the St. Joseph and the St. Mary's are nearly completed. This portion of the line embraces one mile 61 chains, and will cost about the sum of \$28,700.

By adding together the several divisions, it will be seen that the total length of line which has been placed under contract, extending from the junction of the St. Joseph's with the St. Mary's to Georgetown, on the Wabash, including the St. Joseph's Feeder is 89 miles 56½ chains, and that the whole cost, if the present contracts be fulfilled, will amount to about the sum of \$962,168, including the probable cost of superintendence, which gives an average cost of \$10,726 per mile.

From the estimates here given, together with those presented in former reports, an estimate can be made of the whole line of the Wabash and Erie Canal to the original termination, which may be received as a nearer approximation to the actual cost than any heretofore presented: it may be stated as follows, to wit:

Line finished and under contract from Fort Wayne to Georgetown, as above, 89 miles 56½ chains,	\$962,168 00
From Fort Wayne to State line, if the high level be adopted, as per estimate of Mr. Wilson in his report of 30th Nov. last, 19 miles 30 chains,	154,113 13
From Georgetown to the western termination, if the Wabash be crossed on a dam, as per Engineer's report of the 27th Dec. 1834, 20 miles 18 chains,	308,256 51
Total, 129 miles 24½ chains,	\$1,424,537 64
Which gives an average of \$11,017 per mile.	

In this estimate of distance and cost, the St. Joseph's Feeder is included. Deducting the length of this Feeder, and there will remain 122 miles 70½ chains, as the total length of the main line from the east line of the State to the point selected for the termination, about three miles above the mouth of the Tippecanoe.

It will be observed that where two plans of location are under consideration, the cost of the cheapest one has been included, in making up this estimate. Should the lower level be adopted on the Maumee,



near the State line, or should the Wabash be crossed on an Aqueduct, the cost will be somewhat increased.

All which is respectfully submitted,

J. L. WILLIAMS,  
Prin. Engineer.

Indianapolis, Dec. 10, 1835.

*To the Board of Canal Commissioners:*

GENTLEMEN—

The undersigned, having been directed by an order of your Board, dated 11th March last, to take a general supervision of the various canal surveys authorized by the act of the last General Assembly, approved Feb. 6, 1835, begs leave to report,

That at the commencement of this important and responsible duty it was deemed essential in the first place to ascertain the elevation of the various summits to be overcome on the several routes, compared with the streams relied upon for the supply of water, in order that the general principles which should guide each survey might be correctly marked out without delaying the locating parties. With a view to this object a random level party was organized at as early a day as practicable after the reception of the order, and has since that time been constantly employed in advance of the locating parties, and generally in conjunction with them. This party, in the fulfilment of the duties assigned it, has carried a level over a large portion of the State, amounting in the whole extent to about six hundred miles, and has collected a variety of information in regard to the comparative elevation of the several portions of our territory, which has been of much importance in conducting the surveys, and which, added to what has been collected by other parties employed in surveying Canals and Rail Roads, will make up a mass of facts in relation to the topography of the State, which cannot but be highly interesting and important.

The random level party has generally been under the charge of Mr. Anderson Davis, who has conducted its operations with great industry, efficiency and accuracy.

The fact that the Board were so fortunate as to obtain the services of experienced Engineers to survey the several routes, has rendered it wholly unnecessary for me to take that particular charge of the location and estimates of these lines which was contemplated at the date of the order above named. The supervision which I have exercised has been confined chiefly to the establishment of the general principles or plan upon which each survey should be conducted, and to the direction of those preliminary examinations necessary to this object, leaving the particular direction of each survey, and the ascertainment of the quantities of the various items of work necessary to the construc-

tion of a Canal, entirely with the Engineers whom the Board had placed in charge of the locating parties. The Board are respectfully referred to the reports of these Engineers for the cost of each route, and also for a more minute description of the various lines than will be attempted in this report.

It is proper here to remark that from the limited time allowed for the completion of such extensive surveys, passing as they do through a country where no previous examinations of the kind had been made, as well as from the hindrances occasioned by sickness in the several parties, it cannot be supposed that the very best plan or the cheapest route has, in every instance, been adopted. The Engineer who may be charged with the construction of these works will doubtless be enabled, by a more minute examination, to make some improvements in the plans and locations.

Some of the leading principles which have governed in directing the surveys and in estimating the cost of the Canals may be stated as follows:

1st. The dimensions of the Canal as estimated are 40 feet wide at surface of the water, 26 feet at bottom, with 4 feet depth of water—the locks 90 by 15 feet in the chamber, corresponding with the Wabash and Erie Canal, with which these lines are designed to connect.

2rd. The location, plans, and estimates, have generally been made with a view to the most perfect and permanent canal, in order to diminish the cost of future repairs.

3d. While the opening of a navigable communication is the main object for which canals are constructed, yet the creation of valuable water power, to advance the manufacturing interests of the country, is deemed so important that it has been constantly kept in view in these locations and plans.

4th. The requisite supply of water for leakage and evaporation has been rated at at 100 cubic feet per minute for each mile of canal, to which must be added on each summit section the necessary lockage water.

5th. Where a sufficiency of water cannot be obtained during the driest seasons from the natural flow of streams the deficiency may be made up by constructing artificial reservoirs if suitable situations can be found, in which the flood water of the wet season may be retained to be drawn out when needed.

6th. Although reservoirs answer fully the purpose of supplying Canals, yet they are not free from objections, and should be avoided if any other means of supplying the canal can be found even though the length and cost of the line may be increased thereby.

In order to ascertain the quantity of water furnished by the various streams at the points from which they may be introduced into the canals, measures were taken to have them accurately gauged during the driest season, the results of this measurement are as follows:

White river one mile above Muncietown	Sept. 12	1,000	cubic feet	per minute				
do do one mile above Chesterfield	do 15	1,800	cubic feet	do	do	do	do	do
do do at Andersontown	do 16	2,900	do	do	do	do	do	do
do do at broad ripple 8 miles above Ind.	Oct. 19	7,600	do	do	do	do	do	do
do do one mile below Port Royal	Sept. 2	17,600	do	do	do	do	do	do
do do one mile below the mouth of Bean Blossom,	Sept. 3	22,200	do	do	do	do	do	do
Mississinewa at Boyle's mill 7 miles north of Muncietown,	Oct. 20,	320	do	do	do	do	do	do
do 8 miles below Boyle's mill,	Oct. 30,	804	do	do	do	do	do	do
do near Wm. McCormicks,	Sept. 9,	900	do	do	do	do	do	do
do at Robert McCormicks,	Nov. 5,	1,400	do	do	do	do	do	do
do one mile above Marion,	Sept 10,	1,700	do	do	do	do	do	do
Salamonia at Francis Godfroy's,	Sept. 25,	70	do	do	do	do	do	do
do at crossing of Ind. & Ft. W. s. rd.	Sept. 10,	300	do	do	do	do	do	do
Wabash at Knox's old place,	Sept. 25,	250	do	do	do	do	do	do
Fall Creek at Pendleton	Sept. 7,	860	do	do	do	do	do	do
do near the mouth	Sept. 6,	1,800	do	do	do	do	do	do
Blue river, $4\frac{1}{2}$ miles above Shelbyville,	Oct. 22,	3,840	do	do	do	do	do	do
do $\frac{1}{2}$ mile below Shelbyville,	Oct. 23,	4,880	do	do	do	do	do	do
Sugar creek, 1 mile above Michigan rd.	Oct. 21,	970	do	do	do	do	do	do
Brandywine at the Michigan road,	Oct. 22,	750	do	do	do	do	do	do
Wild Cat near the mouth,	Sept. 14,	4,600	do	do	do	do	do	do
Wea, near the mouth,	Sept. 14,	1,800	do	do	do	do	do	do
Shawnee, near the mouth,	Sept. 15,	1,600	do	do	do	do	do	do

Most of these measurements were made by the several Engineers engaged on the different lines, but a part of them by a member of your Board, whose valuable assistance at a time when the Engineers were unable from sickness to attend to this duty, it is proper here so acknowledge.

*Survey for a Canal from Indianapolis to Jeffersonville.*

By an inspection of the maps, it will be seen that the route proposed for this improvement does not run in a direction parallel with the principal vallies which drain the country, and which always present the most natural location for canals, but on the contrary, its course is nearly at right angles to these vallies, making it necessary to cross the dividing ridges which separate them. A canal route so situated necessarily requires a more critical examination and involves greater responsibility in deciding the question of practicability, than ordinary cases.

Two summits, or dividing ridges, were to be overcome on this route; the first being the table land which divides the waters of the West fork of White river from those running into the Driftwood or East fork: the other the high ridge separating the waters of the Silver creek from the valley of the Muskakatack. The summit first named may be designated as the Young's creek summit, and the other the Silver creek summit. To ascertain the relative height of these summits, and the streams from which a supply of water must be obtained, was the first object of the examinations. A level was commenced in Washington street, Indianapolis, and continued across to the waters of Young's cseek, a branch of Driftwood, and thence up the vallies of



**Blue river and Sugar creek.** By this level it was ascertained that the greatest depression in the dividing ridge, is near the farm of Isaac Smock, ten miles south of Indianapolis; that this depression is 85 feet above Indianapolis, and that by cutting 20 feet deep on the summit, feeders may be brought into the summit level from Blue river, at a point four miles above Shelbyville, and from Sugar creek two miles above the Michigan road; and in this manner the water of these streams may be made available for the supply of the canal in either direction from this summit.

Having thus determined the plan upon which the canal across this summit must be constructed, it was deemed advisable before making a definite survey here, to proceed to the Silver creek summit, where greater difficulties were anticipated. The country lying south of the Muskakatack, is generally much elevated above the valley of that stream, and presents a formidable barrier to the construction of a canal. After minute examination, the greatest depression in this ridge was found to be on the farm of Carnes Collings, about four miles south of Vienna. The Pine Lick gap, through which the road from Brownstown to Charlestown passes, was thought by some to be the lowest, but on examination with the level was found to be ninety-two feet higher than the one just named. Collings' gap was therefore selected as the route of the survey, and a level assumed for the bottom of canal, which would give 48 feet cutting on the summit, and which is 127 feet below the Indianapolis level. The distance from proper cutting on one side of the ridge to the same on the other, was found to be over one and a half miles. The earth to be excavated is supposed to be clay.

After determining the proper level for this summit, a line of levels was run, passing down the Pigeon fork of Muskakatack by Vienna, the Slate Ford, Stanfield's mill and Rockford, and thence up the Driftwood fork to a point where that stream was found high enough to pass over the Silver creek summit, which proved to be near the mouth of Little Sand creek about eight miles below Columbus. The surface of the East fork of Muskakatack at the Slate Ford was found to be 58 feet; the West fork at Stanfield's mill 46 feet, and the Driftwood at Rockford 23 feet below the Silver creek summit level. All the branches of the Muskakatack have wide valleys, and as they are much below the proper level, the construction of a canal across them would be very expensive.

For the supply of this summit and the line south of it, no aid can be drawn from the Muskakatack. That stream lies too low for this purpose, and even if it were higher, it is not sufficiently durable to be of any service. No situation favorable for a reservoir, and high enough, to command the summit, has been discovered on the south side of the Muskakatack. The mouth of Big creek was examined, but the valley was found too narrow and its situation too remote to be relied on. The surface of Big creek two miles above its mouth, is five feet below the summit level.

To conduct the waters of the Driftwood across the Muskakatack val-

ley, on a level high enough to command the Silver creek summit, must involve a heavy expense, and yet it seems very evident that this is the only practicable plan for the supply of this canal.

The general principles which should govern the survey, having been thus settled, a more definite examination was commenced near the mouth of Little Sand creek, and continued as far as the head of Silver creek, passing near Rockford, the Slate Ford, and Vienna. Mr. Gooding, the Engineer who had charge of this survey, reports that the particular location of the line, shows the obstacles to the construction of a canal to be very great. The deep cut encountered in passing from the Driftwood valley to the Muskakatack—the high embankments necessary in crossing the various forks of the latter stream, and the deep cut on Silver creek summit are the most considerable difficulties. Mr. Gooding's estimate for 45 miles which he located, including this expensive work, falls little short of \$2,500,000. The remaining portion of the line including fifteen miles of feeder, would be equal to ninety miles, which at 12,000 dollars per mile, would cost 1,080,000 dollars. Adding these sums together, we have 3,580,000 dollars, as the probable cost of the canal from Indianapolis to Jeffersonville, a distance of about 120 miles, averaging a little less than 30,000 per mile.

It is generally true that a canal which is expensive in its construction will require expensive annual repairs, especially if the costly character be given to it by deep cuttings and high embankments, as is the case on this line. The slips and washings which would occur with the going out of the frost, at the several deep cuts, as well as in the very high embankments across the branches of the Muskakatack, would swell the cost of repairs on this line, beyond that of ordinary canals.

The law under which this survey was made, requires that if a canal be found impracticable, a rail road shall be surveyed on the same route. The question of practicability, it will be perceived, depends wholly upon the quantity of water passed by the Driftwood at the point where it lies high enough to command the Silver creek summit. The stream was not gauged at that place, but from measurements made at other points higher up, there is every reason to believe that a sufficiency of water for the canal might be obtained. A canal on this route cannot, therefore, be pronounced physically impracticable, yet the cost of construction and the probable cost of repairs when completed, were found to be so great that it could hardly be considered a feasible or judicious improvement, if viewed with reference to the present condition of the country, and the improvements of another kind which may be adopted as a substitute, and for which the formation of the country is well adapted. From these considerations, it was supposed that the intention of the law would be more fully accomplished by suspending the survey for a canal, in order that an examination for a rail road might be made.

In the course of these examinations it has been ascertained beyond doubt, that so much of this canal as lies between Indianapolis and Columbus, or Rockford, may be constructed at ordinary cost. A branch

canal from Shelbyville to intersect the White river canal at or near Indianapolis, is also practicable at a moderate expense.

Although the cost of the canal from Indianapolis to Jeffersonville may be considered too great to be encountered at the present time, and in the present condition of the country, yet those who look forward, and justly appreciate the magnitude of the interests involved, and the great advances which must take place in the wealth and commercial interests of the country, will not think it an unwarrantable anticipation to suppose that the time may come when the wants of the country, and the object to be accomplished will justify the construction of the work. This improvement has been considered more interesting to Indiana from the consideration that it would afford the means of avoiding the tax which the Falls of the Ohio must ever impose upon the commerce of that river. The proper plan for terminating this canal, would be to make two connections with the Ohio, one entering at the head of the Falls, for the conveyance of the trade from the east, and the other uniting with the the river below the falls, for the trade of the south and south-west. By such a connection the obstruction at the falls would be entirely overcome, so far as the interior of Indiana is concerned.

#### *Survey from Indianapolis to the Wabash and Erie Canal.*

The responsibilities connected with this examination, were greatly increased from the fact that neither in the law authorizing the survey, nor in the order of your Board, was there any particular point named for its connection with the Wabash and Erie Canal. As the chief purpose for which this improvement is required, must be to open to the central and eastern portion of the State, a navigable communication to a northern market, the propriety of intersecting the Wabash and Erie canal as far east as practicable, so as to diminish the distance to Lake Erie, seemed to be undeniable.

The route by Muncietown to Fort Wayne, if practicable, would form a more direct communication than any which has been proposed, and was therefore deemed worthy of examination. although the formation of the country after leaving the valley of White river was known to be unfavorable for a canal, inasmuch as the main valleys which drain it, run transversely with the direction of the route. A level was carried from the Mississinewa in the direction to Fort Wayne, as far as the Wabash, by which the relative height of the streams and the summits or table land which divide them was ascertained. Levels were also run up the Wabash, the Salamonina, and along the Mississinewa, in order to ascertain the probable length of the feeders from these streams, necessary to supply the several summits with water.

From these examinations, it was ascertained that the summit or table land between the Mississinewa and Salamonina, is about 112 feet above the former stream, and that to supply a canal on this summit with water, allowing it to be cut down twenty feet, would require a feeder from the Mississinewa about fifteen miles in length. The summit between the Salamonina and the Wabash, was found to be 86 feet



above the Salamonias, and the length of feeder to supply it from that stream, about twenty miles. The exact height of the table land which divides the waters of the Wabash from those of the St. Marys, was not ascertained, but supposing its relative elevation, with regard to the streams, to correspond with the summit last described, the feeder from the Wabash to supply it, could not be shorter than the one from the Salamonias. The aggregate of these feeders, it will be perceived, nearly equals in length the main line which they are designed to supply. The requisite supply of water for this route is increased, from the fact, that in the plan of the canal, there would be three separate summits, on each of which the ordinary quantity of lockage water would be required. And when it is recollected that the whole supply of water during the dry season, not only for the main line, but also for the feeders, must be drawn from artificial reservoirs, as will be seen from the foregoing measurement of the streams, the impracticability of constructing a canal on this route must be apparent.

The Mississinewa river being the largest and most durable stream in this section of the State, leading towards the Wabash and Erie Canal, it appears evident that the deep valley which it has formed in the face of the country, and in which all the waters of this region accumulate, must present the most advantageous route for this canal, notwithstanding its direction, is not exactly such as would be desirable. And from the examinations which have been made, no point has been discovered where the canal can leave this valley until it reaches the neighborhood of Marion in Grant county, where the stream has received so much accession, that with some aid from the reservoirs on White river a sufficiency of water may be provided to supply the canal across the table land between the Mississinewa & the Wabash.

From Marion to the Wabash and Erie Canal, two routes have been surveyed—one following the immediate valley of the Mississinewa to its mouth—the other crossing the ridge between the Mississinewa and Treaty creek, a branch of the Wabash, and thence down this creek to the Wabash and Erie Canal; both of which routes are practicable. The Treaty creek route is found to be more costly than the other, by the sum of \$94,427 35, but possesses a very important advantage in the fact that by intersecting the Wabash and Erie Canal further east, it would reduce the distance to Lake Erie 24½ miles.

Having thus ascertained that a practicable route for the northern portion of the line, may be found through the deep indentation formed by the Mississinewa, the difficulties which might be presented elsewhere, remained to be considered. From the point where the line shall intersect the White river to Indianapolis, no doubt has at any time been entertained of its entire practicability. But the principal difficulty to be overcome in constructing a canal from Indianapolis to the Wabash, is to be found in furnishing a sufficient supply of water for the summit section, extending from White river to the Mississinewa. And in order that the most advantageous route for this portion of the canal, may be selected, all the facts in relation to the question have been collected, which the limited time would allow.

## ABSTRACT exhibiting the cost of the Upper Route.

No. Sec	Length of Sect.	Lock- age.	Cul- verts.	Total cost.		No. Sec	Length of Sec.	Lock- age.	Cul- verts.	Total cost.	
	Chs.	Feet	No.	Dolls.	Cts		Chs.	Feet.	No.	Dolls.	Cts.
4	39.			11,012	61	Am't brought up. 90,180 33					
5	42.		1	3,190	57	26	39			2,305	24
6	45.		2	5,396	91	27	39			2,337	84
7	36.			1,675	26	28	39		1	3,146	86
8	39.			1,675	31	29	42			2,473	20
9	42.		1	6,332	77	30	42		1	4,655	74
10	41.			2,385	64	31	39			2,599	17
11	40.	8	1	8,924	04	32	39			2,624	72
12	39.			1,967	92	33	42			3,458	25
13	42.			1,986	08	34	39			3,474	44
14	39.			2,505	72	35	42		1	3,811	07
15	39.		1	5,721	39	36	42		1	2,959	28
16	39.			2,832	35	37	39			2,323	99
17	39.		1	4,206	16	38	42		1	3,494	23
18	42.			2,246	02	39	39		1	3,160	88
19	39.	7		7,979	68	40	42			2,988	00
20	39.			3,189	32	41	27			2,691	84
21	42.			3,645	04	42	38.4	7	1	3,089	63
22	39.		1	2,736	52	Chs 1,550.4 \$146,774 71					
23	42.		2	3,417	74						
24	39.			2,383	64	19 m. 30.4 ch. 5perct. 7,338 73					
25	36.		1	4,769	64						
15 11				\$90,180	33	Total cost				\$154,113	44

*ABSTRACT Exhibiting the cost of the Lower Route.*

No. Sec.	Length of Sec.	Lock age.	Cul- verts.	Total cost.		No. Sec.	Length of Sec.	Lock age.	Cul- verts.	Total cost.	
	Chs.	Feet.	No.	Dolls.	Cts.		Chs.	Feet.	No.	Dolls.	Cts.
4	39			11,012	61	Am't brought up					94,8. 3 41
5	42		1	3,190	57	28	39.		1	3,146	86
6	45		2	5,396	91	29	42.			2,473	20
7	36			1,675	26	30	42.		1	4,655	74
8	39			1,675	31	31	39.			2,599	17
9	42		1	6,332	77	32	39.			2,624	72
10	41			2,385	64	33	42.			3,458	25
11	40	8	1	8,924	04	34	36.			2,589	09
12	39			1,967	92	35	12.	24		20,246	32
13	42			1,986	08	36	5.54	8	Dam	24,303	08
14	39			2,505	72	37	33.			4,148	40
15	39		1	5,721	39	38	33.			2,852	55
16	39			2,832	35	39	57.			12,679	82
17	39		1	4,206	16	40	54.			4,187	64
18	42			2,246	02	41	42.			11,857	36
19	39	7		7,979	68	42	33.			8,103	46
20	39			3,189	32	43	42.			6,017	64
21	42			3,645	04	44	51.			3,289	70
22	39		1	2,736	52	45	39.			12,555	20
23	42		2	3,417	74	46	39.			9,502	32
24	39			2,383	64	1,676.54					\$234,111 93
25	36		1	4,769	64						
26	39			2,305	24						
27	39			2,337	84	20 m. 76.54 ch. 5 per ct.					11,705 59
				\$94,823	41	Total cost				\$245,817 52	
						Or, per mile				12,159 64	



*To the Board of Canal Commissioners, of the State of Indiana.*

GENTLEMEN—The undersigned having completed the survey of that portion of the Central Canal route between Indianapolis and the Wabash and Erie Canal, with which he was charged, and finished the estimates of cost relating thereto, begs leave to submit the following

### REPORT.

From the data that had been obtained by previous examination, it was deemed advisable to survey a route across the summit between White river and the Mississinewa, leaving the valley of the former near Andersonstown, and intersecting the latter at the mouth of Deer creek, about five miles above Marion.

To supply this part of the canal, it was evident that an artificial reservoir would be required, as the quantity of water in White river, (the only available stream of any magnitude,) at the point where a feeder must be taken out to command this level, would be wholly inadequate for this purpose during a considerable part of the season. For this reservoir a favorable site was found in a prairie lying between White river and Fall creek, in the vicinity of Andersonstown. Its peculiar advantages consist in the depth to which it may be covered without overflowing the timber land that surrounds it, the tenacity of its soil, and its vicinity to the summit level to be supplied from it.

This reservoir will be formed by making a bank at the north end, 36 chains long, and from 12 to 26 feet high, and at the south end, 33 chs. long and from 9 to 32 feet high, besides about thirty thousand cubic yards of embankment to prevent the water from flowing back at several points on the sides. The banks will be ten feet wide on the top—have a slope of 1.75 base to one foot perpendicular, and be raised five feet above top water line in the reservoir. To protect them from the ravages of such animals as will be likely to occasion breaches, a wall of two inch plank has been estimated in the centre, extending from two feet below the base of the bank to one foot above top water line. Some protection will also be required to secure them from injury by the surf, but the expense of planting trees or shrubs adapted to this purpose, will be trifling, and it is believed that no other protection will be required.

The available depth of water after deducting for loss by evaporation, will be about fourteen feet, and the area included in the reservoir 1400 acres.

Many of the most important objections to artificial reservoirs in general, are not applicable to this, and since it became necessary to derive a supply during a part of the season from such a source, or pronounce the canal impracticable, it is a matter of much gratification that so favorable a place for the purpose has been found.

The land which will be covered with water, is mostly wet prairie, and to convert it to this use would be less injurious to the agricultural interests than would be the case were it more valuable; the banks will not be exposed to the force of a current that would endanger them if built across the valley of a stream, and, from the fact that but a small

part of the area covered by water will ever be exposed to the rays of the sun after the quantity of water in the reservoir shall have been reduced, it is believed that it will not prove in the least deleterious to the health of the inhabitants in the vicinity.

The excess of evaporation over the rains during the season, that there will be such an excess, is calculated at 18 inches from the whole surface. This calculation is founded upon experiments made in various places upon much smaller surfaces, and when it is considered that the proportion is much greater from small than large surfaces, this estimate is deemed fully sufficient to cover the whole loss.

The reservoir will contain after this deduction 765,399,000 cubic feet of available water, and without such deduction, or when filled, 853,608,000 cubic feet, which quantity may be introduced through the feeder in sixty days. The certainty of securing the requisite supply is much greater in this case than it would be if *all* the floods of the stream relied upon as a feeder, were barely sufficient for the purpose; for in that case, if a breach should occur either in the banks of the reservoir or the feeder leading to it during the season of the floods, the necessary supply could not be provided, and navigation might be interrupted for some length of time in consequence.

But here no such danger could exist, for White river would furnish an excess towards filling the reservoir for more than half the year; and should a breach at any time occur that would require a few weeks to repair, there would still be time sufficient to provide an adequate supply.

The waters of Fall creek may also be introduced into the reservoir if necessary, by a short feeder, but no survey and estimate of it was made, as it was not deemed absolutely essential, and time did not permit.

The whole line of canal as surveyed, has, for the sake of perspicuity, been divided into several different divisions, each of which will be separately described.

### *DIVISION NO. 3—or Pipe Creek Summit.*

This division will include the reservoir described, the feeders connected with it, and the main line from Andersontown to Deer creek on the Mississinewa, and embraces that portion of canal where the greatest artificial supply will be required.

The whole length of the feeder from the dam across White river where it is taken in, to the reservoir is 13 1-2 miles. At the distance of 11 miles 17 chains from the head of feeder, the feeder to the reservoir diverges from the navigable one, intersecting the main line near Andersontown, and two miles twenty-three chains further enters an arm of the prairie in which the reservoir is formed. The navigable feeder from the dam above mentioned to the intersection of the main line near Andersontown, is 13 miles 3 chains—11 miles 17 chains being coincident to the feeder supplying the reservoir. Near Andersontown the feeder descends 19.85 feet by two locks, to the Pipe creek summit level, and immediately below, the feeder from the reservoir

is admitted into the canal.

The whole length of that portion of canal and feeder that must be in part supplied from the reservoir, may be stated as follows, to wit:

Whole length of navigable feeder to the intersection of main line	13 miles 3 chains.
Whole length of feeder from the reservoir to the main line	1 " 43 "
Whole length main line from S. end of summit level to Mississinewa	30 " 15 "
Whole length of main line descending from summit on Division No. 1,	" 75 "

Whole length of line requiring an artificial supply	45 " 56 "
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Experience seems to have determined that not less than a hundred cubic feet of water per minute is necessary for each mile of canal, exclusive of lockage water, which will always be in proportion to the amount of business done on the canal.

The demand, then, for 120 days, the period during which a supply must probably be drawn from the reservoir, will be as follows, to wit:

120 days at 4,570 cubic feet per minute	789,696,000 cub. ft.
Lockage water for 100 boats per day	259,200,000 "

Total demand	1048,896,000
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Tee feeder from White river will furnish for 60 days, say Aug. and Sept.	1,600	} 414,720,000
do do do July and Oct.	3,200	
The average per minute is 2,400		

Deficiency to be made up from reservoir	634,176,000
Supply in reservoir after deducting for evaporat'n	765,399,000

Surplus	131,223,000
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From this calculation which it is believed will be found very nearly correct, it will be seen that there will be a surplus remaining in the reservoir capable of supplying a further demand.

The cost of this division is greatly increased in consequence of the necessity of constructing a reservoir on the side of the river opposite to that upon which the supply is required, and crossing on a level so high as to render the aqueduct across the river and the embankment across the bottom, very expensive. Another large item of expense is the cost of the feeder to fill the reservoir.

In order to sustain a level sufficiently high for the purpose, much heavy embankment will be required to form the feeder along the slope of the high ground that skirts the valley, which is in many places very abrupt. At several points bluffs or washed banks are passed, where the towing path, as in all similar cases hereafter mentioned in this report, will be partly or wholly built in the river, and the slope of the bank exposed to the force of the current, protected by a covering of stone, where such material can be found within a convenient distance, and in other places by brush.



The country between the valleys of White river and the Mississinewa is generally quite favorable to the construction of a canal. The only streams of any magnitude between these rivers crossed by the line, are Killbuck and Pipe creeks, the former of which is crossed about 3 miles above its junction with White river, and the latter about fourteen.

The most expensive portions of earth work on the main line, are the embankments across the valleys of White river, Killbuck, and Pipe creek; and the deep cutting through a wet prairie between the latter streams, and one of a similar kind near Palmer's.

All the stone work on this division will be expensive, as no quarries within a convenient distance, have been discovered, from which stone of a suitable quality for building structures on the canal can be procured. The locks on the navigable feeder at Andersontown, and those at the north end of the summit near the mouth of Deer creek, are all estimated of cut stone. The aqueducts across White river and Killbuck, will be built with hammer-dressed stone abutments and piers, and wooden superstructures. Pipe creek will be crossed by a wooden culvert of 24 feet chord.

The total length of the main line from the intersection of the feeder at S. end of the summit level to the Mississinewa 30 ms. 15 chs.

Length of navigable feeder	-	-	-	-	13	"	03	"
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Total length of line navigable	-	-	-	-	43	"	18	"
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Feeder line not navigable	-	-	-	-	3	"	66	"
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Total number of locks on main line	8,	lockage	65 feet
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"	"	Aqueducts	2,
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"	"	Culverts	26,
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"	"	locks on feeder	2,	lockage	19.85 feet.
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"	"	Culverts	"	11,
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"	"	Dams	"	1,
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"	"	Bluffs	"	length	76½ chains.
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Total cost of division including main line, reservoirs and feeder	-	-	-	-	-	-	\$787,687	31
-------------------------------------------------------------------	---	---	---	---	---	---	-----------	----

Cost per mile of navigable line	-	-	-	-	-	-	18,222	96
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### DIVISION NO. 3—Muncietown Summit.

This division commences at the head of the feeder that supplies the Andersontown reservoir, thence *via* Muncietown across the summit to the Mississinewa, and thence down the valley of that river to the mouth of Deer creek, where it intersects the line that crosses Pipe creek summit above described.

This portion of the canal as well as the preceding, will require the aid of an artificial reservoir to a very considerable extent. White river will barely furnish the necessary supply for the canal in its immediate valley during several months in summer and autumn, and the minimum discharge of the Mississinewa at the point where the canal line first intersects it, is extremely small—altogether insufficient to afford

the necessary supply for the canal for some distance below. It is presumed, however, that White river and the Mississinewa will afford a permanent supply for the whole of this division, except for an average distance of 20 miles for 120 days in a year. In August and September, an artificial supply would probably be required for a greater distance; in July and October, less. A reservoir to make up the requisite supply, can be formed in the valley of White river, a short distance above Muncietown, and a prairie taken in connection, extending in the direction of the canal line across the summit. The manner of constructing it will be to build a dam across the river three hundred feet long and twenty-eight feet high from the river bed which is here composed of rock; and a bank across the valley varying in height from twenty to twenty-eight feet for a distance of fifty-two chains. The whole length of bank required at the south end of the reservoir is eighty-one chains, and at the north end, or across the prairie, twenty-one chains. The latter bank, however, will be light.

These banks like those of the Andersontown reservoir, will be raised five feet above the surface of the water in the reservoir, and protected in a similar manner.

The dam will be built by laying a foundation of trees eight feet in thickness, upon which crib-work in the form of a roof with slopes of two and a half feet base to one foot perpendicular on each side, filled with stone and covered with six inch plank, will be raised twenty feet. A heavy bank of gravel, (or common earth, with a covering of stone if gravel cannot be procured.) must be placed on the upper slope extending some distance up the stream, to give additional security to the dam and prevent as much as possible the leakage that so great a pressure will be likely to occasion.

A feeder dam for the line below the summit level, in the pool of which the canal will cross the river, will be constructed a short distance below the reservoir, to save the water that may leak from it or flow over the dam above described at certain seasons of the year; and this will raise the water over the tree foundation of the reservoir dam, at the same time preserving it from decay and reducing the pressure by diminishing the height of the column in the pool above.

The feeder dam will be built in the same manner as the one for the reservoir, with the exception of the tree foundation, the crib work being commenced on the rock bottom of the river. The abutments of both dams are estimated of timber.

The site selected for this reservoir is not so favorable as could have been wished, but is the best that could be found to supply the summit on this route. The bank across the bottom, and the dam across the river, will always be exposed to danger in time of floods from the large quantities of ice and drift that will be brought down by the current. In order to secure a quantity of water sufficient to supply the demand, a large body of good land must be covered with water when the reservoir is filled, a great portion of which will again be left dry when the water in the reservoir is but partly drawn off. Numerous depressions extending a considerable distance from the main body of the re-

reservoir will be filled by water during a part of the season, rendering the lands that they intersect less valuable; and it is feared that the exposure of so much land to the rays of the sun during the warmest part of summer, that had been previously under water and must be covered with partially decayed vegetation, would prove prejudicial to the health of the inhabitants residing in its immediate neighborhood.

The reservoir in the prairie and river bottom will cover an area of 2,446 acres. These are objectionable features, but it is believed that reservoirs are now in use, and have been used as sources of supply for many years, in situations less favorable than the one at Muncietown.

This reservoir will contain after deducting the same for loss by evaporation, as in the one at Andersontown, viz: 18 inches in depth from the whole surface, C. ft. 685,745,000

The whole demand maybe calculated equal  
to the total supply of 20 miles at 100 cub. ft.

per minute per mile, for 120 days, 345,600,000

Lockage water for the passage of 100 boats,  
per day, for 120 days, 259,200,000

604,800,000

Surplus

80,945,000

The line from the head of the Andersontown reservoir feeder to the point where it crosses White river in the pool of the feeder dam just below the reservoir, is the cheapest part of this division, the ground being generally quite favorable. From White River to the Mississinewa the line will be expensive, much deep cutting and heavy embankment being required to form the canal along the side of the reservoir in the prairie. After crossing the river the canal rises to the summit level by a lock of 6½ feet lift. Above this lock, or on the summit level, the surface of water in the reservoir, when filled, will be 17 feet above the bottom of canal.

The route surveyed intersects the Mississinewa a short distance below Boyle's mill, and at the point of intersection a feeder is taken in, by making a dam across the river, similar to the one below the reservoir at Muncietown. From this point to the intersection of the line surveyed across Pipe creek summit at the mouth of Deer creek, the route is along the left bank of the Mississinewa, at no place leaving the river for any considerable distance. The necessity of taking in feeders frequently renders this part of the line considerably more expensive than it would otherwise be. In addition to the dams, head-gates, &c., the necessity of keeping a low level greatly increases the quantities and the cost of excavation and embankment. There are, also, several expensive sections of bluffs where it becomes necessary to build the towing path in the river and protect the outer slope.

One of these bluffs is passed in the pool of a dam which considerably diminishes the cost.



The law which authorizes this survey, taken in connection with the supplemental act, seems to require that Muncietown be made a point if possible—but if a canal by that place be found impracticable, that some other route be surveyed. In accordance with the requirements of the law the examinations were commenced at Muncietown early in the spring. By the random levels which had previously been run along the dividing ridge between White river and the Mississinewa, it had been ascertained that a favorable depression in this ridge was to be found near Muncietown, and also that another depression, 77 feet lower than this one, existed near Palmer's on the head of Pipe creek. It was at once obvious that the practicability of the Muncietown route must depend wholly upon the quantity of water furnished by the streams in that vicinity; and as this fact could not be determined until the season of low water, which usually comes late in the summer, and as the information received from the inhabitants and from other sources, was such as to afford reason to question the practicability of the route, it was deemed advisable to have examinations progressing on other routes simultaneously with this. From Andersontown on White river to the mouth of Deer creek on the Mississinewa, five miles above Marion; two routes have therefore been surveyed and estimated—one by the way of Muncietown, and the other by Palmer's.

The advantages of the route last named, over that by Muncietown, are, that it is 26 miles 75 chains shorter, has less lockage by 154 feet, and will cost less by the sum of \$161,132 22.

Whatever route may be adopted across this summit, the supply of water in the driest seasons, must be furnished in part by reservoirs. For the supply of the summit section on the upper route, a reservoir site was selected in the bed and valley of White river, a short distance above Muncietown; for the lower or Pipe creek route, a reservoir will be formed on the wet prairie, which lies between Andersontown and Pendleton. I have united with Mr. Gooding in the selection of these reservoir sites, and on the computation of demand and supply for these routes, contained in his report to the Board, and I willingly express my concurrence in the opinion that the resources for water are ample, and that the plans for supplying the canal, are entirely practicable and feasible.

From Palmer's on the Pipe creek summit to Strawtown, a route six or seven miles shorter than the one surveyed, might be obtained by continuing the main line down the valley of Pipe creek, and intersecting the White river valley near the mouth of that stream; but upon this plan, eleven miles would be added to the length of the White river feeder, and the total length of line to be supplied with water from the summit level would, therefore, be considerably increased. This plan may be deemed worthy of examination in the final location of the line.

Another deviation from the line surveyed between Andersontown and Indianapolis has been proposed, passing down the valley of Fall creek. The advantages which may be urged in favor of this route over the one down White river, are, that it would be shorter by seven

or eight miles, and that it would probably cost much less. On the other hand, it may be objected to this route, when compared with the other, that it has much less water for its supply—Fall creek affording but little over one fourth the water found in White river, and if practicable at all, must be, to a much greater extent, dependent upon reservoirs. A further objection may be seen in the fact, that the construction of a canal along the valley of Fall creek, would rather diminish than increase the natural manufacturing advantages of the country: while on the White river, much valuable water power will be created by the canal. The construction of a canal along the valley of a large stream, on which the erection of dams is so expensive as to discourage individual enterprise, generally adds greatly to the effective water power of the country, and consequently promotes all its manufacturing interests; while if the stream be small and in its natural state, easily controlled, as is the case with Fall creek, the diversion of its waters for the purpose of feeding a canal, does not increase the amount of water power but rather diminishes that which may already exist.

The limited time allowed for these surveys did not admit of more than a partial examination of the Fall creek route. The decision of questions like this, and the one presented by the suggested deviation on Pipe creek, cannot be correctly made without ample time for investigation, and it is therefore believed that these subjects belong more appropriately to those who may be entrusted with the construction of the canal, than to the Engineers who make the preliminary surveys. Those who have directed these surveys in the various sections of the state, have been impressed with the belief that their legitimate object was to determine that a practicable route could be found, and to ascertain the probable cost, rather than to decide upon the precise location of these works.

*Survey from Indianapolis to the Ohio River, at Evansville.*

The practicability of constructing a canal on this route as far as the forks of White river, was sufficiently evident previous to the commencement of the survey, from the fact that its course is along the valley of White river, from which an ample supply of water could be obtained—but to open a navigable communication from the Forks of White river across to the Ohio, was viewed as a matter of greater difficulty, and as the canal could not be of much public utility unless this was accomplished, this question was considered of the highest importance.

In order that the Engineer in charge of this survey should be made acquainted, at as early a day as practicable, with the prominent features of the country lying south of White river, Mr. Davis was directed, in the month of July, to repair with his party to Princeton, and commence and continue a level along the ridge which divides the waters of the Patoka from those of the Ohio, as far east as the centre of Dubois county; thence across the Patoka valley and down the ridge separating the Patoka from White river, for the purpose of ascertaining the greatest depression in these ridges. After selecting the low-

est gap, he was instructed to assume a level, for bottom of canal, which would given twenty feet cutting on the summit ridge, and to continue this level to the forks of White river, and thence up both branches of that stream; until the water was found high enough to command the summits. By these levels it was found that the fall in the West Fork is greater than that in the East Fork, and consequently that a supply of water could be more readily obtained from the former stream, which in the upper part of Daviess county, was found high enough to command the Patoka and Pigeon summits—and thus the practicability of the canal from Indianapolis to Evansville, was fully ascertained.

The most considerable obstructions on this route are the deep cuts through the ridges, on the north and south side of the Potoka, the high embankment across the valley of that stream, and the crossing of the East Fork of White River. These will swell the cost of construction and repairs.

*Survey from the Wabash and Erie Canal at Terre-Haute to the Central Canal at the mouth of Eel River.*

From the examinations which have been made, it appears that the summit between the head branches of Honey creek, a tributary of the Wabash, and the waters of Eel river, a branch of White river, is only 36 feet above the surface of Eel river, at its great western bend in Clay county. By cutting down this summit 21 feet and constructing a Feeder from Eel river, about three miles in length, the waters of this stream may be made available for the supply of this summit, as well as the lower levels of the Canal. Whether the natural flow of the stream is sufficient at the lowest stage to supply the whole extent of the Canal, is a question that has not been fully ascertained, though from the best information that can be obtained it is believed to be adequate. The valley is represented to be favorable for the formation of Reservoirs, so that the deficiency, should there be any, could be made up in this way. From the facts reported, there is therefore, sufficient evidence of the practicability of connecting the Wabash and Erie Canal with the proposed Central Canal by this route, thus making the lower part of the Central Canal the common outlet for the trade of both the White River and Wabash valleys.

The length of this Canal from Terre-Haute to the Central Canal is 43½ miles. The descent from the summit level to the level of the Wabash and Erie Canal at Terre-Haute, is 89 feet, and to the Central Canal 35 feet, making the total Lockage 124 feet. The total cost, including Feeders, is estimated by Mr. Davis, the Engineer who made the survey, at \$629,631 65, which, taking the length of the feeder into the account, will give \$13,540 46, as the average cost per mile. The Locks and other mechanical structures are estimated of permanent stone masonry.



*Survey of the Wabash and Erie Canal from Fort Wayne to the State line.*

The general features of the Maumee valley are found to be different from most of the main valleys of the country. The high hills and abrupt undulations which are usually found bordering valleys like this, are not seen here, but on the contrary the level table land comes in many places directly to the stream. The immediate valley is narrow, and the river in passing through it very frequently comes in contact with the high land, forming washed banks along which the construction of a Canal, if on a low level, will be attended with great expense. But the washed banks or bluffs are not in any case very high—the most of them rising only 30 or 35 feet above the water, and so long as a level can be maintained high enough to command these bluffs, a very cheap and safe line can be obtained.

To what extent the high level can be preserved in descending the Maumee valley, depends wholly upon the plan which may be adopted for supplying the Canal with water. The supply which can properly be drawn east from the summit level after passing the necessary quantity westwardly, will probably be exhausted by the time it reaches the vicinity of the State line. In order to avoid the heavy cost and the circuitous location which will be involved if the line be dropped down to the level of the Maumee river, to receive a Feeder, the plan of supplying the canal by means of reservoirs, has been proposed. Whether the saving of expense will justify the adoption of a less perfect mode of supplying the canal, is a question which can be more properly settled after further examinations shall have been made, and when all the important considerations having a bearing upon it are properly appreciated. While it is evident that the high level has important advantages, and should be preferred if an adequate supply of water can be provided, it is nevertheless certain that these advantages should not induce a location which would in any degree affect the usefulness of the work, especially when it is considered that the Wabash and Erie Canal must form the outlet for the trade of an extensive country, embracing the greater part of Indiana and a portion of Illinois. Indeed, when we consider the great augmentation of business which the Canal must receive as it approaches the Lake, through the various projected improvements destined to connect with it, there would seem to be a propriety in enlarging the dimensions of the eastern section, as has been suggested, rather than to diminish its capacity by making it dependent upon a limited or uncertain supply of water. The important questions connected with this location cannot be properly determined without a full knowledge of the line and all its dependencies and connections, from the summit to the mouth of the Auglaize, in Ohio; and for this reason it is obvious that there should be co-operation between the Engineers of Ohio and those who may be charged with the location in this State.

A careful survey and estimate from Fort Wayne to the State line has been made by L. B. Wilson, Esq., acting generally under my advice, whose report is respectfully referred to for the particulars of the

location and for the cost of the canal. One line has been run upon the principle of maintaining a high level for the whole distance, and another upon the plan of taking in a Feeder at the "Bull Rapids" five miles above the State line.

### GENERAL REMARKS.

In connection with the examinations made in the south-western part of the State, the level was continued from Dubois county along the ridge which divides the waters of the East Fork from those of the Ohio, as far east as Scott county. This ridge, which stretches itself parallel with the Ohio, and nearly across the whole breadth of the State, is generally so elevated as to present a formidable barrier to the construction of canals from the interior direct to the Ohio. Excepting on the Jeffersonville survey, there is no practicable route for a canal from the White River valleys to the Ohio river, crossing this ridge farther east than Pike county—Rail Roads or Turnpikes are the only improvements of which this section of the state is susceptible.

On the route along which the level was carried from the east line of Pike to the centre of Scott county, the lowest point on the dividing ridge is at Collings' Gap, on the line of the Jeffersonville survey, which is 80 feet below Indianapolis; the next lowest point is near the line between Washington and Orange counties, and is 49 feet above the same place; and the highest point discovered by any of the examinations in this part of the State, which is eight miles west of Vienna, on the road to Salem, is 299 feet above Indianapolis. This point is 60 feet higher than Muncietown, and is supposed to be nearly on a level with Winchester in Randolph county, which is doubtless the most elevated county in the State.

In the course of the examinations which have been made during the past season, with a view to the internal improvement of the State, many facts have been collected in regard to the general formation of the country, the comparative elevation of various prominent points, the descent of the streams, &c., which besides serving the purpose for which they were obtained, will be of some importance in regard to the geological investigations which may hereafter be made. That Indiana has within her territory valuable mineral resources, which when fully developed and made subservient to the wants of the country, will form an important addition to the wealth of the State, there is every reason to believe.

But these mineral riches will remain in a great degree unknown, until the importance of this subject shall be so far appreciated as to command for it a more thorough investigation than has yet been given. And when this investigation of the mineral and geological character of the State shall be made, whether it be conducted by public or private enterprise, it is supposed that a knowledge of these comparative elevations can be usefully applied to the subject. And in order that they may be preserved as a matter of convenient reference, a table of altitudes is now in preparation and will be presented in a few days as a special report. This table embraces such points as were considered most

important to the object, and gives at one view their altitude with regard to the plain on which the capitol of the State is built, high water mark of the Ohio at the head of the Falls, the surface of Lake Erie, and tide water in the Hudson.

For a large portion of these facts, the State is indebted to Col. Stansbury, the principal Engineer of the Rail Road surveys, who has zealously united with me in the compilation of this table.

All which is respectfully submitted,

J. L. WILLIAMS,  
*Prin. Engineer.*

*Indianapolis, Dec. 15, 1835.*

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*To Jesse L. Williams, Principal Engineer Wabash and Erie Canal:*

*Sir—*

In obedience to your instructions which were based upon an act of the last Legislature, directing me to make a location of that part of the Wabash and Erie Canal which lies between Fort Wayne and the State line of Ohio: and also to run a line diverging at a point, in the line, contemplated in the foregoing directions, with a view of dropping down to take in a Feeder at "Bull Rapids," and thence on that level to the State line, I now

## REPORT,

That in compliance with these instructions, the survey was commenced at the eastern end of section No. 3 east, at present under the progress of construction, and continued along the bluff of the Maumee river, a distance of half a mile to a point where the river recedes from the high ground, thence along the northern slope of the hill, or high ground, crossing Taylor's and Colman's runs, whose valleys present the only broken feature in this division to Lock No. 1 east. Here the summit section terminates, being 26 miles and 15 chains in length, including the length of the St. Joseph's Feeder, and extends 5 miles and 29 chains east of the mouth of this Feeder.

From Lock No. 1, the line passes over a country of very gentle inclination to the north, a distance of 4 miles 22 chains to Lock No. 2, crossing McIntosh's, Six and Seven Mile creeks, whose valleys are narrow and depressed ten or fifteen feet below the level of the adjacent country, hence to the State line, the country is peculiarly favorable to the construction of a cheap canal. The deep ravines through which the wet lands are drained to the river, present the only obstructions; and these are short and mostly crossed at their heads. Lock No. 3 has been located 35 chains west of the State line. The whole line has been marked and laid off into sections of convenient length preparatory to its being placed under contract.



As the country bordering on the Canal line is but sparsely inhabited, a large amount of surplus produce cannot be expected for the consumption of those employed in constructing the work: and as the excess over that furnished by the inhabitants must be brought from the more densely populated parts of the State, or from the State of Ohio, the cost of the work has in consequence been estimated at prices equal to about 10 per cent. upon those paid for similar work executed upon the line heretofore completed, or upon that which is in progress of construction.

Stone of suitable quality for building is not found in this portion of the State; the estimates are consequently based upon the supposition that wood will be used in the construction of both Locks and Culverts. But as the Canal will be completed from Fort Wayne to the vicinity of Wabash, where good stone can be had, before these Locks will be constructed, the propriety of erecting them of wood, may be very questionable.

The length of the *upper route* is 19 miles 30 chains, and is subdivided into 39 sections. The total cost of which, including 5 per cent. for superintendence and engineering, as per abstract hereto annexed, is

	\$154,113 13
Or, per mile,	7,952 17

This route embraces 22 feet of lockage, and occupies the high level.

The length of the *lower route* is 20 miles  $76\frac{1}{2}$  chains, divided into 43 sections, and embraces a Feeder  $5\frac{1}{2}$  chains in length. The estimated cost of this route is

	\$254,817 52
Or, per mile,	12,159 64

This line for a distance of  $5\frac{1}{2}$  miles is maintained on the *low level*, embraces five Lift Locks equal to 39 feet lockage, one Dam and Guard Lock. Both lines occupy the same ground for the distance of 15 miles, and are consequently of equal cost to that point; thence to the State line, the cost of the *upper route* will be

	\$34,643 02
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Or, per mile,	7,909 36
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This division embraces one Lift Lock of seven feet. The cost of the *lower route* from the same point to the State line will be

	\$126,547 10
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Or, per mile,	21,246 82
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This includes three Lift Locks, eight feet each, a Dam and Guard Lock.

The great cost of this subdivision is not chargeable alone to the construction of the Dam and Locks. A Dam of 10 feet in height was supposed to be the most favorable elevation, and to lock down to the most desirable position for its erection, deep excavations had to be encountered: and besides, the canal bank below that point must necessarily be placed at the base of the high washed bluff of the Maumee, which requires protection from abrasion by the floods, for a distance of 24 miles. It may, however, be found cheaper to erect the Dam 10 or 15 chains below its present site, and to raise it two or three feet higher, by which the deep excavations could be avoided, and the quantity of embankment lessened: but the protection would still be required. The propriety of this change, however, can only be ascertained by more mi-

nute examination, which will no doubt be made before the line shall be put under contract.

If, in connection with the construction of this work, a prospective view be taken of the probable amount of trade which will accumulate at Fort Wayne, seeking in that direction, an outlet to a northern market; after the dormant wealth of the Wabash, White River and White Water valleys shall have been developed, true policy would seem to require its enlargement, in its *primary construction* to the dimensions suited to the wants of the country, ten years after the Canal shall have been opened to the Lake. But these are suggestions called forth by the anticipated wealth of the country and not demanded by your instructions.

Herewith you will receive the Map, Profile, and estimates of the routes, all of which are respectfully submitted.

L. B. WILSON,  
*Engineer.*

*Logansport, November 30th, 1835.*

Total length of Division No. 3,	44 miles 07 chs.
“ “ navigable feeder from south end of Division No. 3 to Andersontown,	13 “ 03 “
“ “ navigable line from Andersontown to Deer creek	57 “ 10 “
“ cost of Division No. 3	\$733,442 36
“ “ navigable Feeder	215,377 17
“ “ navigable line from Andersontown to Deer creek	\$948,819 53
“ “ per mile	16,609 53
“ No. of Lift Locks 25 Lockage 199 feet.	
“ “ Feeder Dams 5 and 1 Reservoir Dam.	
“ “ Guard Locks 1 Culverts 34.	

Aggregate length of Bluffs 5 miles 77 chains.

The navigable feeder is merely included in this division to show the total cost and length of the line from Andersontown via Muncietown to the mouth of Deer creek. An abstract of the feeder is given with Division No. 2.

#### *DIVISION NO. 4—Terminating near Peru.*

At the mouth of Deer creek the canal enters the pool of a dam along which a towing path is made for 129 chains, to a point a short distance above the dam where the canal again commences and continues on the same level to Marion. This distance is about five miles, and no obstacle of any magnitude is encountered to render the canal expensive.

By keeping up the level, advantage is taken of a depression back of a long bluff above the town, and a cheap line obtained for nearly the whole distance.

From Marion two routes were surveyed, one intersecting the Wabash and Erie Canal near Peru, in Miami county, and the other opposite the mouth of Treaty creek near the town of Wabash, in Wabash county.

Examinations were made with a view to intersect the canal at Lago, or some point farther east than that at which the survey was terminated, but no favorable depression was found except that formed by Treaty creek.

As a critical survey of the two routes has been made, the estimates on both will be given with the comparative merits of each.

Between Marion and the termination near Peru, the canal follows the immediate valley of the Mississinewa, except in one instance. About four miles below Marion a favorable depression commences, through which the route passes back of Conner's Bluff, and a cheap line is obtained to the southern boundary of the Great Miami Reserve, soon after crossing which the canal descends to the river and enters the pool of a dam; this being the second of a series of dams, (the first being at the mouth of Deer creek), which form slack water navigation in all, 8 miles 68 chains, and by means of which some of the most formidable



bluffs on the river are passed by constructing a towing path at their base.

On that portion of the line where slack water is introduced, an independent canal could only be made at an enormous expense, and though a very great saving in cost will be effected by substituting slack water, it may perhaps be considered a less perfect improvement. Its *disadvantages* when connected with a canal, as in this case, are in the frequent changes from one to the other, and the consequent change of towing path, in the number of guard locks, and in the danger to which boats may be exposed in time of floods.

The *advantages* of this mode of improvement, and especially in this instance, may be found in the immense water power created at the dams and locks, and in the greater ease with which boats may be moved in a large pool in an ordinary stage of water.

The dams will all be founded on a rock bottom and built in a permanent manner with good stone abutments, and may be considered as secure as any similar structures can be made.

For several miles above the termination, a good and cheap line is obtained, the character of the valley having entirely changed, presenting instead of a regular succession of precipitous rocky bluffs, a high and beautiful bottom well adapted to the construction of a canal. The line intersects the Wabash and Erie Canal a short distance below the mouth of the Mississinewa, where it crosses in the pool of the *feeder dam* near Peru, and connects with the canal through the feeder at that point.

Total length of *Division No. 4*, on this route is 36 miles 73 chains.

" cost of <i>Division</i>	\$574,304 92
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" " per mile	15,558 54
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" distance of slack water, 8 miles 68 chains.

Aggregate length of bluffs 6 " 47 "

Number of Lift Locks 19 Lockage 167 feet.

Total number of <i>Guard Locks</i>	6
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" " Dams	6
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" " Culverts	30
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At all the bluffs on this *division*, where the canal bank or towing path requires protection, stone protection has been estimated. The *lift* and *guard locks* are estimated of cut stone, and the *dam abutments* and part of the culverts of hammer dressed stone masonry.

#### *DIVISION NO. 4—Terminating near Wabash.*

This route coincides with the division last described, from Deer creek to Marion. But below Marion there is a difference of 9 feet in the levels, though the two routes are near each other for five miles further.

The level of the canal at the upper end of this division is kept up until the depression formed by Treaty creek admits of descent towards the Wabash, and the necessity of maintaining this level so as to reduce as much as practicable the deep cutting between the Mississinewa and Treaty creek, adds greatly to the expense of passing the

bluff just below Marion and crossing the Mississinewa river. The point of crossing is about five miles below Marion, or ten miles from the upper end of division. The crossing will here be effected by means of an aqueduct (on a level 42 feet above low water in the river); the abutments and piers of which will be built of hammer dressed stone masonry, and the superstructure of wood. The valley at this point is narrow, but the embankment for a short distance very heavy, and the whole line to the Wabash and Erie Canal expensive.

The canal route leaves the valley of the Mississinewa near Shingle-masher's village, about two miles below the point of crossing and the Deep Cut commences, which extends to Tocina's creek. The length of the deep cut is 30 chains, and the average depth 20 feet. From Tocina's to Treaty creek, a distance of about seven miles, the cutting varies from six to fifteen feet, except in the depression caused by Grant's creek and a number of small branches. The soil in which this deep cutting is necessary appears to be principally composed of clay.

About fifteen miles from Marion the line intersects Treaty creek, down the valley of which it continues to the Wabash bottoms, locking down rapidly to conform to the descent of the creek. The whole amount of lockage from the intersection of Treaty creek to the pool of the dam at the point of crossing Wabash river, is 147 feet. The river is here crossed as at the lower termination, by means of a towing path bridge. The dam which forms the pool for crossing, will be built about half a mile below, near a stone quarry, and will be formed of crib work, in the manner heretofore described, resting on a foundation of trees and brush three feet in thickness, which will be placed below low water in the river.

The canal will connect with the Wabash and Erie Canal nearly opposite the mouth of Treaty creek, by means of two ascending locks, the total lift of which is 14.2 feet.

Total distance from Deer creek, or length of Division, 25 m. 61 chs.

" cost	-	-	-	\$668,732 27
" cost per mile	-	-	-	25,960 10
" number of Lift Locks 18—Lockage 161.2 feet.				
" Aqueduct	-	-	-	1
" Culverts	-	-	-	29
" Dams	-	-	-	3
" Bluff (at Marion),	-	-	-	51 ch

It will be seen that this route is 11 miles 12 chains *shorter* than the one down the valley of the Mississinewa, and will cost \$94,427 35 more. But to this difference in the length of the two lines should be added the distance between Peru and Wabash, the two points of intersection on the Wabash and Erie Canal, in order to give the total difference to Lake Erie, or the eastern market. This being 15 miles, the total difference will be 26 miles 12 chains. The important saving in distance effected by this route should be duly considered, as this canal will probably form, at no distant period, the principal channel of commerce for a large and fertile portion of the State.

An objection, however, to this route, though by no means an insurmountable one, exists in the deficiency of the supply of water furnished by the Mississinewa. The river at the point where the feeder is taken in below the mouth of Deer creek, will afford a sufficient supply, except about 60 days in a year, when it must be, in part, drawn from an *artificial reservoir*.

The whole water of the river will be required for, probably, 120 days in each season, and this diversion of the water from its natural course will injure the mills established for some distance below; but it is believed that this loss will be in part or wholly made up by the water power created during a part of the season at the locks in the valley of Treaty creek.

To ascertain what supply from an artificial source would be required, guages were made of the Mississinewa at several different times during the past season near the point where the feeder will be taken in for this route; and from the results obtained it is believed that it will be safe to assume 1400 cubic feet per minute as the average discharge during the 60 days that there will probably be a deficiency.

The *demand*, then, will stand thus, to wit:

25 miles (line to be supplied)	100 cub. feet per	
mile, per minute, for 60 days,		216,000,000 c. ft.
Supply from river, 1400 c. ft. per minute, for 60 d.		120,960,000 "

<i>Deficiency to be made up from reservoir</i>	95,040,000 "
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It will be seen by reference to the calculation of demand and supply for Pipe creek summit, that there will be a surplus left in the *Andersontown reservoir* after the demand on that summit

is supplied, of	131,223,000 c. ft.
From this deduct the demand for Treaty creek	
line	95,040,000 "

Surplus	36,183,000 "
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Should the route by Muncietown be adopted instead of that by Pipe creek summit, it will be necessary to enlarge the Muncietown reservoir, by increasing the height of the *dam* and *banks* which form it, or to encounter the expense of making another small one, probably, in the valley of the Mississinewa.

The surplus in the reservoir at <i>Muncietown</i> , as	
will be seen by reference, is	80,945,000 c. ft.
Demand for Treaty creek line	94,040,000 "

Deficiency	14,095,000 "
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#### *DIVISION NO. 1—Between Andersontown and Indianapolis.*

This division extending from the south end of the Pipe creek summit level near Andersontown, to the connection with Capt. Cleveland's line in the south-west part of Indianapolis, receives its whole supply of water (except in descending from the summit), from White river,



and is located in its immediate valley. *Three* feeders are introduced on this portion of the canal, which will not only furnish an ample supply for all the purposes of navigation, but admit a surplus that will afford a large amount of water power at each of the locks in its passage down. The first feeder will be introduced just below Andersontown; the second, 17 miles 69 chains below the first; and the third and last at Broad Ripple, 20 miles 38 chains below the second, and 8 miles 77 chains above Washington street, Indianapolis.

The chief obstacles to the construction of a canal, not only on this division, but on all the route or routes surveyed in the valleys of White River and the Mississinewa, are the bluffs or washed banks that will, generally, render the sections of canal on which they occur, very expensive.

These bluffs are mostly composed of clay, (except on a portion of the Mississinewa where they are partly rock,) and vary in height from 30 to 60 feet. They are all so similar in character that a particular description of each is deemed unnecessary.

With the exception of the obstacles above named, the route on this division is remarkably favorable. Few streams of any magnitude are crossed by the line; Stony creek and Fall creek being the principal, and the plain earth work is very light. The most expensive excavation is encountered in order to pass back of some of the bluffs instead of forming the canal at their base. The deepest cut of this kind is a short distance above Strawtown, where a long and difficult bluff is thus avoided. The most expensive full embankment will be across the bottom of Fall creek.

The line as surveyed, passes through or very near all the towns on the route. Through Indianapolis a line of levels was merely run to connect with Capt. Cleveland's in the lower part of town, and to estimate the cost; but it is gratifying to know that without materially increasing the cost, the canal may be located through any part of this flourishing seat of government.

It may hereafter be deemed a matter of expediency to make the canal from broad Ripple to Indianapolis of larger dimensions than ordinary, to give a greater amount of water power at this important point than could otherwise be given without creating too strong a current in the canal. But a canal of the size that this is estimated, will pass all the water that flows in the river at its lowest stage, and give a surplus of at least 5000 cubic feet per minute at Indianapolis, where the fall from the surface of the water in the canal to the low water of White river will be 36 feet.

Between the feeder at Andersontown and Broad Ripple, there are 16 locks and 122 feet of lockage, and it will be safe to calculate on passing 2,200 cubic feet per minute at each of these locks during the lowest stage of water. No estimate of the value of the water power created on this division, will here be made, but it may be seen at a glance that it will be immense.

Total length of <i>Division No. 1</i> ,	47 miles 38 chains.
“ cost	\$535,804 96
“ “ per mile	11,286 04
“ number of Lift Locks 20—Lockage 156.	
“ “ Guard Locks	2
“ “ Feeder Dams	3
“ “ Aqueducts	1
“ “ Culverts	30

Bluffs, aggregate length 4 miles 36 chains.

The following statement will show the cost of forming a connection with the Wabash and Erie Canal on several different Plans, together with the length and lockage.

### PLAN NO. 1.

Total length of main line from Indianapolis via Pipe creek summit to the Wabash and Erie Canal near <i>Wabash town</i>	103 miles 34 chs.
Navigable Feeder from Andersontown up White river	13 “ 3 “
Total length of line navigable	116 “ 37 “
“ number of Lift Locks 48—Lockage 402.05 feet.	
“ cost	\$1,992,224 54
“ “ per mile	17,106 51

### PLAN NO. 2.

Total length of main line from Indianapolis via Pipe creek summit to the Wabash and Erie Canal, near <i>Peru</i>	114 miles 46 chs.
Navigable Feeder, as in Plan No. 1,	13 “ 3 “
Total length of line navigable	127 “ 49 “
“ number of Lift Locks 49—Lockage 407.35 feet.	
“ cost	\$1,897,797 19
“ “ per mile	14,871 85

### PLAN NO. 3.

Total length of canal from Indianapolis via Pipe creek summit to the Wabash and Erie Canal at <i>Wabash town</i> , including lateral canal to <i>Muncie-town</i>	124 miles 51 chs.
Total number of Lift Locks 54—Lockage 450.05 feet.	
“ cost	\$2,103,153 61
“ “ per mile	16,873 83

## PLAN NO. 4.

Total length of canal from Indianapolis via Pipe creek summit to the Wabash and Erie Canal at *Peru*, including lateral canal as in Plan No. 3, 135 miles 63 chs.  
 Total number of Lift Locks 55—Lockage 455.85 feet.  
 “ cost \$2,008,726 26  
 “ “ per mile 14,793 12

## PLAN NO. 5.

Total length of canal from Indianapolis via Muncie-town to the Wabash and Erie Canal at *Wabash-town* 130 miles 29 chs.  
 Total number of Lift Locks 65—Lockage 536.05 feet.  
 “ cost \$2,153,356 76  
 “ “ per mile 16,519 54

## PLAN NO. 6.

Total length of canal from Indianapolis via Muncie-town to the Wabash and Erie Canal at *Peru*, 141 miles 41 chs.  
 Total number of Lift Locks 66—Lockage 541.85 feet.  
 “ cost \$2,058,929 41  
 “ “ per mile 14,549 71

As the principal object of the survey appears to have been to determine the practicability of making a canal to connect the valley of White river with the Wabash and Erie Canal, and at the same time to accommodate Muncietown, and to collect such facts as might govern a future location, these various plans are presented in order to embody those facts in different forms. But these plans do not, in all respects, show a fair comparison of the different *divisions* taken to form a connected line. Structures of equal permanency and value have not been estimated on all the various portions of the routes surveyed in consequence of the impossibility of procuring suitable materials without an extravagant cost. On Division No. 1, 13 locks are estimated of wood, and 23 on Division No 3, whilst on Division No 2, and both routes of Division No. 4 *all*, the principal structures will be built of durable stone masonry.

An additional expenditure will be necessary to protect the embankments formed along the base of the bluffs on Division No. 1 and No. 3 after the canal shall have been completed 2 or 3 years, the protection at present, except in a few instances, being estimated of brush. This kind of protection will secure the embankments until stone can be cheaply taken to the places required on the canal to protect in a permanent manner.

For particulars not given in the body of the report, reference may be had to the *abstracts of Divisions* which will show the *length, cost, and quality* of work of the different sections or subdivisions into which the whole line has been divided.



On the accompanying maps the line will be found represented as follows, to wit:

Division No. 1 on maps No. 1 and 2.

do. Nos. 2 and 3 on map No. 3.

do. No. 4, (two routes) on map No. 4.

The valuable counsel and assistance of Mr. Williams, Chief Engineer, in tracing the outlines of the surveys, and more especially in locating the reservoirs, and in relation to the important question of demand and supply on the summits, is gratefully acknowledged.

In making the surveys, estimates and maps of the routes described, the most essential aid, both in the field and the office has been rendered by Messrs. Ball, Davis, and Holman, Assistant Engineers. The zeal, industry, and ability with which they have discharged their various and arduous duties merit the highest praise, and justly entitle them to the confidence of those who have now, or may hereafter have charge of the public works in Indiana.

Respectfully submitted,

WM. GOODING,  
*Engineer.*

*Indianapolis, Dec. 15, 1835.*

# ABSTRACT OF DIVISION NO. 1, North of Indianapolis.

No. Sec.	Length.	Dolls.	Cts.	DESCRIPTION OF WORK.
1	74	50,166	90	One road bridge, four cut stone locks, total 34 ft.
Feeder		11,434	72	whole length, 76.5 chs. feeder dam & head gates
2	42	1,624	19	Plain.
3	81	20,188	45	2 culv's wood, 21 chs. bluff, 1 cut stone lock, 7 ft.
4	81	11,042	63	1 " " 34.5 chs. bluff
5	81	4,138	83	1 " "
6	81	5,870	50	1 " "
7	81	20,763	69	1 " " 21 chs. bluff, 1 cut stone lock, 9 ft.
8	81	3,641	20	Plain.
9	81	19,750	08	1 " " 13.5 chs. bluff, 1 cut stone lock, 9 ft.
10	81	7,785	45	1 wood lock, 7 ft.
11	81	2,732	16	13 chs. do.
12	79	7,749	75	1 " lock 7 ft.
13	81	2,519	42	Plain.
14	81	3,997	13	1 " " "
15	81	5,479	52	"
16	81	16,850	43	Heavy excav. and bank.
17	81	4,987	97	1 " "
18	81	11,970	41	1 " " road bridge, 2 wood l'ks, total 15 ft.
19	81	24,345	79	1 " " feed. dam, g'd l'k; 2 w'd l'ks, " 16 ft.
20	81	16,692	48	22.5 chs. bluff
21	81	10,282	41	1 " " 6 chs. "
22	81	3,793	47	Road Bridge
23	81	4,472	96	Plain
24	81	8,395	01	Road Bridge, 1 wood lock, 8 ft.
25	81	9,078	84	1 " " Road Bridge
26	81	12,946	45	1 " " 9 chs. bluff 1 " lock 8 ft.
27	81	13,255	70	1 wood culvert 24 chs. bluff
28	81	17,046	56	27 chs. " 1 wood lock, 7 ft.
29	81	22,635	63	1 " " 52.5 chs. bluff
30	81	5,205	00	1.5 chs. "
31	81	11,743	08	1 " " 18 chs. "
32	81	7,150	16	3 " "
33	81	12,999	71	1 " " 13.5 chs. " 1 wood lock 7 ft.
34	81	8,106	90	1 " " 15 " "
35	81	3,930	05	1 " " Plain
36	81	5,408	91	2 " " Plain
37	81	8,104	47	1 " " 1 wood lock, 6 ft.
38	81	7,727	24	1 " "
39	30	23,102	88	Feeder dam, G. Lock; 2 " locks 16 ft.
40	81	5,506	68	Plain
41	81	3,909	83	Road Bridge
42	81	5,676	34	Plain
43	81	20,260	02	39 chs. bluff, road bridge
44	81	10,815	98	15 chs. "

## ABSTRACT OF DIVISION No. 1—Continued.

No. Sec.	Length.	Dolls.	CENTS.	DESCRIPTION OF WORK.
45	81	5,714	31	Road Bridge
46	81	24,219	61	1 wood culv. aqued't for Fall cr. and heavy bank.
47	81	6,272	52	1 " "
48	90	4,262	54	1 " "
		535,804	96	Total cost. Total length 47 miles and 38 chains.
				\$11,286 04½ Average cost per mile.

## ABSTRACT OF DIVISION NO. 2, North of Indianapolis.

No. Sec.	Length.	Dolls.	CENTS.	DESCRIPTION OF WORK.
1	81	15,382	56	(Feeder line.) Feeder dam and Head Gates.
2	81	7,523	16	12 chains bluff
3	81	9,459	64	1 wood culvert
4	81	18,648	19	1 " " 36 chs. bluff
5	81	13,443	77	1 " " "
6	81	9,747	46	6 " "
7	81	21,065	76	1 " " "
8	81	8,506	61	Plain
9	69	17,456	83	2 " " Road Bridge
10	81	29,749	06	2 " " "
11	99	22,219	79	2 " " 22.5 chs. bluff
		8,368	92	Feeder to Andersontown reservoir 2 ms. 23 chs.
12	81	8,271	81	1 wood culv't, road bridge
13	65.35	32,902	53	Road bridge, 2 cut stone locks; total 19.85 ft.
		9,767	98	Feeder from Andersontown reservoir 123 chs.
1	30	122,639	72	Aqueduct for White river, and heavy full bank
2	99	9,728	13	1 wood culv't.
3	72	17,158	86	2 " " "
4	84	48,846	35	1 " " Aqueduct for Killbuck, r'd bridge
5	81	7,966	00	2 " " "
6	81	5,788	04	2 " " "
7	81	4,621	06	1 " " "
8	81	10,253	44	Deep cut
9	81	21,340	80	" "



## ABSTRACT OF DIVISION No. 2—Continued.

No. Sec.	Length.	Dolls.	CENTS.	DESCRIPTION OF WORK.
10	81	4,603	56	Plain
11	81	5,748	53	2 wood culv'ts, 1 road bridge
12	81	23,169	25	3 " " crosses Pipe creek
13	81	9,196	38	1 " "
14	81	5,600	73	2 " "
15	81	8,183	62	2 " "
16	81	4,847	61	1 " "
17	81	3,584	32	Plain
18	81	3,315	93	Plain
19	81	8,623	08	Plain
20	81	10,707	42	Nine feet cut
21	81	8,877	50	Seven feet cut
22	81	3,780	71	Plain
23	84	3,124	44	Plain
44	81	4,303	08	Plain
25	81	4,316	32	Plain
26	81	6,199	09	3 wood culv'ts
27	81	5,600	59	1 " "
28	81	19,060	82	one cut stone lock, 9 ft.
29	81	6,603	20	2 " "
30	81	37,216	90	Road bridge, 3 cut stone locks—total 24 ft.
31	20	43,022	46	4 cut stone locks—total 32 ft.
		76,140	30	Total cost of the Andersontown reservoir
		787,687	31	Total cost. Total length 43 miles 18 chains.
		\$18,222	96	Average cost per mile.

# ABSTRACT OF DIVISION NO. 3—North of Indianapolis.

No. of Sec.	Length.	Dols.	Cents.	Description of Work.	
1	51	12,991	40	18 chs. bluff: 2 wood Locks, total	14 ft.
2	81	21,718	56	2 wood Cul. crosses Buck cr. 1 wood Lock lift	9 ft.
3	81	4,464	48	1 Road Bridge.	
4	81	6,475	84	3 chains Bluff.	
5	81	14,410	32	21 do. do. 1 " Lock lift	8
6	81	8,028	42	15 do. do.	
7	84	17,143	79	2 wood Culverts, 33 chs bluff, 1 " Lock lift	8
8	114	25,696	25	Feeder dam, G. Lock, 1 " Lock	9
9	81	20,761	31	Towing path Bridge.	
10	81	16,715	70	Heavy excavations and bank.	
11	81	15,301	54	do. and do.	
12	81	16,966	00	All excavation.	
13	81	17,902	01	do.	
14	81	11,276	00	do. 1 Road Bridge.	
15	81	14,480	69	2 wood culverts. 2 wood locks lift	16
16	81	10,700	25	2 " do. Road Bridge. 1 " lock	9
17	81	22,110	90	Feeder dam and head gates 3 " locks	23
18	81	8,629	19	1 wood culvert, 6 chs. bluff, Road Bridge.	
19	81	8,941	67	1 " do. 6 " do.	
20	81	7,803	91	1 " lock lift	9
21	81	6,017	91	2 " culverts.	
22	81	3,055	85	Plain.	
23	81	16,026	16	2 " locks lift	20
24	81	20,049	03	2 " culverts, feeder dam and head gates.	
25	81	14,804	42	27 chs. bluff, 1 wood lock lift	7
26	81	7,965	20	2 " culverts 9 " do.	
27	81	11,714	80	12 " do. 1 " lock lift	8
28	81	13,116	07	1 " " 12 " do.	
29	81	16,915	37	2 " " 39 " do. 2 lift locks	14
30	81	4,944	30	1 " " 9 " do.	
31	81	23,322	69	1 " " feeder dam and G. Lock.	
32	81	20,266	59	2 " " 39 " bluff.	
33	81	8,203	99	15 " do.	
34	81	10,074	48	2 " " 24 " do.	
35	81	17,932	25	1 " " 27 " do. 1 wood lock lift	7
36	81	6,096	62	Plain.	
37	63	27,489	08	1 " " 21 chs. do. feeder dam 1 w. lock	10
38	81	20,379	15	1 " " 39 " do.	
39	81	20,479	36	1 " " 36 " do. Road Bridge.	
40	81	21,948	25	1 " " 40 " do.	
41	81	11,735	21	2 " " 15 " do. 1 wood lock lift	9
42	81	16,412	84	1 " " 54 " do.	
43	137	31,798	72	1 stone " 18 " do. 2 cut stone locks, 13.50	
		100,192	79	Cost of Muncietown Reservoir.	
		\$733,442	36	Total cost. Total length 44 miles 7 chs.	
		16,636	05	Average cost per mile.	

*ABSTRACT OF DIVISION NO. 4—North of Indianapolis, terminating at Wabash town.*

No. Sec.	Length.	Dolls.	Cents.	Description of Work.
1	43	3,833	51	Towing path Bridge, (slack water commences.)
2	81	5,656	16	Slack water ends.
3	81	23,201	79	Feeder Dam and G. Lock, 12 chs. bluff.
4	81	9,170	33	Plain.
5	81	7,888	22	Plain. (Diverging point at the end of this sec.
6	105	32,089	30	1 wood culv't 51 chs. bluff (or at upper end of this)
7	81	4,609	73	1 " do. plain.
8	81	9,972	59	1 stone do. and Road Bridge.
9	81	7,476	71	3 " do.
10	75.20	108,881	33	2 wood do. Aqued'ct for crossing Mississinewa
11	60	23,953	63	2 stone do.
12	81	26,043	26	1 " do. and one wood culvert.
13	81	33,939	37	2 " do. deep cut.
14	81	10,923	97	3 wood do.
15	81	16,380	46	1 " do.
16	81	12,629	96	1 " do. 2 stone do.
17	81	12,660	35	2 " do.
18	81	26,428	74	Deep Cut.
19	81	16,236	30	do do.
20	81	12,971	11	1 stone culvert for Treaty creek.
21	81	32,521	75	3 wood do. 2 cut stone locks, total 20 ft.
22	81	21,384	68	1 stone do. T. P. Bridge, 1 stone Lock 9
23	81	30,117	41	1 wood do. 2 " L'ks, total 18
24	81	51,618	40	Dam for Tr. cr. R. & T. P. Bridges, 4 st. Lks 33
25	81	57,484	46	4 stone Locks total 39
26	76.90	70,658	75	Wabash Dam, T. P. Bridge, 5 cut stone
				Locks, total 42.20
		\$668,732	27	Total cost. Total length 25 m. 61 chs. 10 lks.
		25,960	10	Average cost per mile.



*ABSTRACT OF DIVISION NO. 4—North of Indianapolis, terminating near Peru.*

No. Sec.	Length.	Dols.	Cents.	DESCRIPTION OF WORK.
1	43	3,833	51	Towing path, Bridge, (slack water commences).
2	81	5,656	16	Slack water ends.
3	81	23,201	79	12 chs. bluff, Feeder Dam, G. Lock.
4	81	9,170	33	Plain.
5	81	7,888	22	Plain.
6	78	21,839	84	1 wood culv't, 30 chs. bluff, 1 cut stone L'k lift 9 ft
7	81	11,858	79	2 stone do. 24 " do. 1 Road Bridge.
8	81	9,918	01	1 " do. plain.
9	81	7,945	26	2 " do. and 1 wood culvert.
10	81	5,020	62	2 wood do.
11	81	4,499	21	1 " do.
12	66	40,943	85	4 cut stone Locks, total 39
13	81	24,408	26	1 " do. Dam and G. Lock, 36 chs bluff.
14	81	14,694	95	1 stone do. 24 chs. bluff.
15	81	10,635	59	1 " do. and 1 wood, plain.
16	81	8,641	21	Plain.
17	81	31,067	62	1 " do. 21 chs. bluff, 2 cut st. L'ks. total 19 ft
18	81	19,291	79	1 " do. 28.5 " do 1 " " Lock " 8
19	81	18,115	31	10.5 " do 1 " " do. 10
20	81	12,496	17	2 " do. 42.0 " do.
21	81	36,061	94	1 wood cul. 15 ch. bluff, dam, G. L'k. 1 cut st. L'k 10 "
22	81	5,212	00	48 " do. T. P. Bridge.
23	81	29,155	73	2 " cul. 15 " do. Dam and G. Lock.
24	69	17,230	06	2 " " 45 " do. 1 cut stone lock lift 9 "
25	78	19,150	41	34 " do. Dam G. L'k & T. P. Brd'g
26	81	27,649	29	18 " do. 2 cut stone locks, total 16 ft
27	84	7,937	55	34 " do.
28	81	24,074	62	36 " do. Dam and G. Lock.
29	81	3,691	04	Plain.
30	81	6,411	39	1 stone culvert.
31	81	4,983	57	Plain
32	78	22,060	44	1 wood culvert, 2 cut stone locks total 18 ft
33	81	21,124	80	1 stone do. 39.5 chs. bluff.
34	81	6,527	71	3 " do.
35	81	15,207	39	1 wood do. 6 chs. bluff. 1 cut stone lock 9 ft
36	81	14,434	34	1 " " lock 9 ft
37	108	22,366	15	1 " do. T. P. Bridge 2 " " locks 13 ft
\$574,304 92				Total cost. Total length 36 m. 73 chains.
15,558 54				Average cost per mile.

*To the Board of Canal Commissioners of the State of Indiana:*

GENTLEMEN—

Pursuant to your instructions, and in fulfilment of the 10th and 11th sections of the "Act to provide for the further prosecution of the Wabash and Erie Canal, and for other purposes," I have examined so much of the line therein designated, as extends from Indianapolis south, to the Ohio river, and have the honor to submit in relation thereto the following

REPORT.

From the commencement, near the State House, to the head of section 18, being *Division No. 1*, the line passes mostly through a wide alluvial bottom, which presents many facilities for the favorable location of a canal. In making choice of the levels best adapted to the character of the country, it was deemed advisable to select those nearly coinciding with the extreme high water line of the river; thereby avoiding the irregularities in direction and level of the more elevated country, and placing the line upon an uniform surface, where the course might be more direct, and the earth to be removed of a lighter character. The same reasons have also governed, in some degree, the location of the line in other parts of the valley below.

On this division there are nine locks, with an aggregate lift of 81 feet; being a greater amount of lockage than on any other portion of the line of the same length. This brings the level down to within two feet of the surface of low water in the river at the foot of the bluffs. At this point it is proposed to introduce a feeder by a cut of 5 chains in length, and a dam of 7 feet in height. By means of a guard lock, which is estimated at the head of the feeder, a communication with the canal will be opened to the country on the west side of the river, through the pool of the dam. By a change in the location of lock No. 9, the feeder might be introduced from a point higher up the river by a very low dam. This would increase the length of the feeder as well as the cost of the line along the bluffs, but it is worthy of examination and may be the preferable plan.

The bluff on this division is the longest on the line; being 96½ chains, or nearly 1½ miles. There are, however, only 51 chains requiring protection, and for much of the distance a low bottom intervenes between the hill and river, of sufficient width for the base of the tow path. An extensive bed of sand stone in strata of different thicknesses, alternating with shale, is laid bare by the river near the foot of the bluffs, forming a valuable quarry, and one which is extensively worked. The material for forming the tow path is abundant, and consists of sand and gravel, with some clay and fragments of rock.

This part of the line crosses several tributaries of considerable size. *Pleasant run* is crossed by a timber arch of 20 feet; and *Lick creek* by a similar structure of 18 feet span. *Buck creek* by a dam 60 feet long and 8 feet high; *Pleasant creek* by an aqueduct with a wooden trunk of

26 feet reach; and *Honey creek* by a stone arch of 20 feet chord. Besides these there are two stone culverts of small size, and four rectangular ones of wood.

Wherever stone is made use of on this division it must necessarily be obtained from the quarry at the bluffs, or further up on the west side of the river. This circumstance will tend materially to increase the cost of the work. In order to diminish this increased expenditure, as far as prudence will justify, it is proposed to employ wood only, at the two first crossings. This can be replaced with stone hereafter, without great expense, as the foundations will in the first instance be so arranged as to admit of a stone structure of the same size and form.

In the construction of the locks, however, both on this division and on all other parts of the line, it was deemed advisable to estimate stone, even at considerable cost, and it is perhaps questionable, whether true economy would not dictate the same course in relation to the other structures.

To avoid the necessity of passing along the face of the bluffs, the plan has been suggested of keeping up a higher level and passing the ridge which forms them, through a depression back of the town of Port Royal; thence following the valley of Bluff creek, and intersecting the present line near the crossing of that stream at the foot of the bluffs. On this plan the embankment and protection in the river would be avoided, and the location of 4 locks changed to a point, near which the stone required in their construction could be obtained. By keeping up the level below lock No. 4, at the foot of the "Big Hill," the ridge could be passed with about 15 feet cutting in the deepest part; but much heavy embankment would be encountered in the line above, and its length would be considerably increased. The liability to accident would also be as great at the heavy embankments across the valleys as at the embankment in the river, and with the deep cut through the ridge, it is doubtful whether the diminished cost of the locks would be equivalent to the increased expense of the earth work.

The aggregate cost of this division, comprising 17 miles, is \$225,216 60, or \$13,248 03 per mile. And it may here be proper to remark, that in this, as in the other divisions that follow, I have added to the estimated cost of construction, a contingent amount of ten per cent. to cover the cost of superintendence and for unforeseen expenditures.

The 2d Division of the line extends from the head of section 18 to the foot of section 50, immediately below the second feeder, and comprises 33 miles. The first stream crossed on this division is *Crooked creek*, which is passed in the pool of a dam 40 feet in length. The next is *Stotts' creek*, a tributary of considerable magnitude, which is passed on an aqueduct, with a horizontal wooden trunk, in two reaches of 36 feet span. *Clear creek*, a small but durable stream, is passed on a stone arch of 18 feet chord. Half a mile below this stream, the line reaches *Bluff No. 2*, which presents some unfavorable features. At the upper end of this bluff, the river has laid bare a stratum of shale, on which rests a deep bed of clay, forming the principal portion of the hill, and which appears evidently to have slipped at different times in large



masses. By throwing the tow path so far into the river, as not to be under the necessity of cutting deeply into the hill, it can probably be passed without serious danger from slips. Passing by a short sand *Bluff No. 3* requiring twelve chains of protection, the line on section 32 strikes the west side of the town of Martinsville, and three miles further down crosses *Big Indian creek* on two semi-circular arches of 20 feet chord. Immediately after crossing this stream, the line enters a gap in the main upland but little elevated above the river bottoms. Here as well as in two other places below, nature has singularly opened a way for the passage of the canal through a deep narrow depression in the main land, thereby insulating a high and rocky bluff which is washed by the river, and which it would otherwise be difficult and expensive to pass. The next stream met with is *Little Indian creek*, which is passed on an arch of 20 feet chord, and a short distance below is *Bluff No. 4*, at Evilsizer's mill. Here the river for a short distance has cut into a deep stratum of thinly laminated sand stone, passing into shale, which disintegrates by exposure. This forms part of the bed of the stream; and the tow path which will require 10 chains of protection rests principally upon it. *Bluff No. 5* is a short one, requiring only 6 chains of protection. *Bryant's creek* is crossed on an arch of 16 feet chord. At *Bluff No. 6* the river again cuts into a stratum of sand stone and shale, which also forms part of the bed of the stream. The material for forming the tow path, is a sandy loam lying above the rock and showing no inclination to slip; 27 chains of protection will here be needed. *Bluff No. 7* immediately below *Branch run*, which is crossed on an arch of 16 feet chord, is similar in character to those above. The rock which is of the same useless kind, is somewhat higher and presents a perpendicular face to the river of 15 or 20 feet. Above this rock, however, and nearly at the top of the hill, is a better quality of soft sand stone in suitable strata for building. Limestone of a good quality is also abundant near here. This bluff will require 27 chains of protection. A short distance below this is *Bluff No. 8*, which is a lime stone containing fossil remains, and will require 9 chains of protection. About a mile below this, and not far above the town of Gosport, is *Bluff No. 9*, which is longer than those above, and owing to a scarcity of earth will be more expensive. In other respects it resembles them, having a shallow and rocky shore, and will require 33 chains of protection. Below the town of Gosport the line crosses *Bean Blossom*, one of the largest class of tributaries. Across this stream it is proposed to construct an aqueduct, with a wooden trunk in three reaches of 30 feet span. Stone of a good quality are abundant in the immediate neighborhood. Three quarters of a mile below this is *Bluff No. 10*, which differs in some particulars from those above; the river does not wash the rock for the whole length of the bluff, and in places the water is deep. There is good material for the towing path which will require 32 chains of protection. On this section, which is the last in the division, it is proposed to introduce a second feeder from the river by a dam of six or seven feet in height above low water, and as the line approaches near the river, a cut will not be ne-

cessary, there being barely room for the guard lock, which it is proposed to construct, to connect the canal with the country on the west side of the river.

On this division there are ten locks with an aggregate lift of 87 feet.

Besides the eight streams enumerated above, there are 52 others, which are passed on stone culverts of 6, 8 and 12 feet chord.

The 9 bluffs described, comprise an aggregate length of 198 chains, or nearly 2½ miles requiring protection from the river.

The whole cost of this division is \$366,032 51, or \$11,091 89 per mile.

*Division No. 3* extends from the head of section 51 to station 3186 on section 120, which is the commencement of the summit level, and contains 69 miles 36 chains.

On the first section of this division are *Bluffs No. 11* and *12*, composed in part of a lime stone rock, containing gredes of pure carbonate of lime and chrystalized quartz. Their base is washed by the river, the rock extending under the water and forming a solid base for the tow path. The water is generally shallow near the shore, and the bank is thrown into the stream to avoid the necessity of a greater amount of rock excavation than will be sufficient for the protection, which on both bluffs will be 25 chains. One mile below these and of the same character is *Bluff No. 13*, requiring 13 chains of protection. Nearly a mile further down is *Bluff No. 14* opposite the town of Brintonsville and is of a more formidable character than the last. The rock is more solid and in strata of various thicknesses. The water in some places is deep near the shore and the river bears hard against the bank, requiring a strong protection of 17 chains. Below this *McCormick's creek* is passed on an arch of 18 feet span. *Bluff No. 15* is opposite the town of Spencer and presents no great difficulty. The rock here is a good lime stone, in suitable strata for building, a portion of which must necessarily be excavated and may be used in some of the structures on the section, or for protection if required. *Bluff No. 16*, two miles below Spencer is light, requiring but three chains of protection. The line on sections 62, 63 and 64 again passes through a glade, leaving two high and very rocky bluffs between it and the river. At *Bluff No. 17* the river bears hard against the bank, making 16 chains of protection necessary, which will be taken from the rock excavation. *Raccoon creek* is crossed on an aqueduct with one reach of 36 feet. Two miles further down the line passes *Bluff No. 18* requiring only 5 chains of protection, and on section 76, 77, and 78, it passes for the third time through a depression leaving a large extent of high and broken country to the right. Through this glade, and on to section 85, a distance of ten miles the line passes over a fine alluvial bottom not far from the bill, in which sand stone is abundant and mineral coal appears to exist in large quantities. On the last mentioned section about one mile below Bloomfield, is *Bluff No. 19*, which presents a sloping face to the river of nearly width sufficient for the base of the bank, which will require 18 chains of protection. Two miles below



this the line passes *Richland creek*, a large and rapid stream on an aqueduct with 2 reaches of 34 feet span. Bluffs Nos. 20 and 21 are generally rocky, presenting, in some places, a perpendicular face of 15 or 20 feet to the river. The rock excavation will form the protection which will be 24 chains in length. *Doan's creek* is passed on an arch of 18 feet chord. At *Bluff No. 22*, the river has cut nearly half its width into a shelly sand rock, forming a solid base for the tow path in the river; 21 chains of protection will be needed. At this place it is probable that the third and last feeder will be introduced, to supply the canal to the Ohio river. Passing below this, the line crosses *Slinhard's creek* on an arch of 24 feet chord, and enters immediately into a country of barrens and prairie, through which, with the exception of the stone work, a very direct and cheap line can be traced. *Prairie creek* is passed on an aqueduct with two reaches of 30 feet span. *Bluff No. 23* is short and will require but eight chains of protection. On this division, and in the neighborhood of Washington, a route was suggested which would better accommodate the interests of that place, but which time did not permit to examine with the level. The route alluded to, would diverge from the present line about five miles above Washington, and taking a more eastwardly direction pass into town near its western side. A deep cut would be encountered before reaching the place, after which the line would turn abruptly to the right, and intersect the present one at or near the crossing of the Vincennes road.

In addition to the streams mentioned on this division, there are 38 others crossed on culverts of from 6 to 16 feet chord.

The bluffs enumerated will require an aggregate protection of 150 chains, or 1.7 miles.

The aggregate lockage on this division is 112 feet distributed among 14 locks.

The aggregate cost is \$629,601 37, and \$9,065 53½ per mile.

*Division No. 4*, being the summit level, extends from station 3186 to the foot of section 156, the end of deep cutting on the Pigeon summit; a distance of 36.55 miles, and includes the most difficult and expensive portion of the line.

The first stream on this division is *Veal's creek*, crossed on an arch of 30 feet chord; and immediately below is *Bluff No. 24*, composed in part of lime stone, shale and coal; the latter in a thick stratum, but of inferior quality. The bank will be thrown but little into the river, and will require ten chains of protection. The next *Bluff No. 25* will require no protection. Passing on through an alluvial bottom, and occupying for nearly two miles, the road leading from Washington to Petersburg, the line strikes the East Fork of White river, near the Ferry and about half a mile above its junction with the West Fork. It is proposed to cross this stream on an aqueduct with two stone abutments and 7 piers, 40 feet in height above the foundations, surmounted by a wooden trunk, simply braced, and in reaches of 46 feet span; making a total clear water way of 368 feet. Without attempting to discuss the comparative merits of different structures for crossing large



streams, it may not be improper here to remark, that this kind of trunk has been adopted from the belief that experience has proved it to be, all things considered, the cheapest, the most secure, and the most easily repaired. A high point on the south side of the stream, with a rock bottom nearly 1-3 the distance across will favor the security of the work, as well as its economical construction. After crossing this stream, the line inclines westward down the valley of the main river, adhering closely to the face of the hills, crossing some deep valleys, and passing *Bluff No. 26* where the tow path will be thrown partly into the river, and will require 12 chains of protection. Soon after passing this bluff, the line, as surveyed, was taken up a deep ravine and crossing a narrow ridge passed through the town of Petersburg into the valley of Pride's creek, at the head of which, and connecting with the water of Flat creek, the lowest gap is found in the ridge between White river and Patoka. The line as estimated, however, will continue to follow the valley of White river, nearly to the mouth of Pride's creek, passing the last *Bluff No. 27*, requiring 20 chs. of protection near the junction of the two valleys, and thence up the valley of the last named stream, leaving the town of Petersburg close to the left, and connecting with the surveyed line at station 3542. From this point where the depth of cutting is four feet, the line crosses the creek on an arch of 20 feet chord, and continues to ascend the valley, the cutting gradually increasing, until at station 3600 it attains its maximum, being 40 feet; thence descending the valley of Flat creek, the cutting diminishes, and at station 3649 is again but four feet; making the whole distance through the ridge, on the level of four feet above bottom just four miles, and the amount of excavation equivalent to an uniform depth of  $15\frac{1}{2}$  feet for the same distance. Proceeding down the valley of Flat creek about three miles and turning slightly up that of Patoka, the line reaches that stream where it washes a steep sloping point. This is a sluggish stream, and has cut a deep bed through a wide clay bottom. It is proposed to cross it on an aqueduct with three reaches of 40 feet span. Crossing this valley which is a mile in width, on an embankment averaging 15 feet above the surface, the line after touching the hill, again inclines westward down the valley, following the general course of the high land, and crossing in its way some narrow ridges of deep cutting, the valley of the South Fork which it passes on an aqueduct with one reach of 30 feet, and Keg's creek on an arch of 16 feet chord, and encountering much heavy embankment, it reaches the valley of Lost creek. Up this valley it passes to station 4103 where the depth of cutting is four feet, and continues its passage to the lowest gap in the ridge between Patoka and Pigeon rivers, where the depth is 28.60 feet; thence descending a branch of the latter stream, it reaches station 4160 where the cutting is 5.80 feet. Making the whole distance across 2.14 miles, and the equivalent depth on a level surface 14 feet.

In addition to the streams enumerated on this division, there are 27 others, crossed on arches, varying from 6 to 12 feet chord.

The bluffs on this division will require an aggregate length of protection in the river of 43 chains.

The cost of this division is \$800,097 21, or \$21,890 48 per mile.

The principal causes operating to produce the heavy cost of this division, are, the aqueduct across the East Fork, the two high ridges through which the line passes, and the deep and wide valleys over which it is carried. The valleys of the Patoka and its tributaries, as well as of the streams generally south of the East Fork, possess some peculiar features. Unlike the valleys of most western streams, they are not diversified by second and third bottoms, forming narrow and elevated passes, but are unusually wide, and of uniform width and level, presenting a flat unvaried surface from hill to hill.

*Division No. 5* extends from the head of section 157 to the Ohio river and comprises 32 miles.

From the head of this division the summit level was maintained, for reasons which will hereafter be given, and passing down the valley of the Dry Fork two miles, crosses that stream on an arch of 16 feet chord, and immediately afterwards the Clear Fork on an arch of 20 feet chord; thence proceeding down their united valleys, over a broken surface, and crossing the Muddy Fork on an arch of 20 feet chord, it bends up the valley of that stream about two miles, and enters that of the Hurricane Fork. Up this the line passes to station 4462, where the cutting is four feet and continues to increase 2.6 miles, to station 4531, where it is 44.60 feet. It then descends rapidly into the valley of Blue Grass for 6-10 of a mile, where the cutting is again four feet at station 4547. From this point the course is unobstructed, and passing down the valley of Blue Grass, the line is gradually locked down, crossing in its course the Middle Fork of Blue Grass on an arch of 20 feet chord, Little Blue Grass on an arch of 16 feet chord, Lick branch on an arch of 14 feet chord, and Main Pigeon on an aqueduct with three reaches of 40 feet span. After which, proceeding on a gently undulating plain, it reaches the Ohio river in the town of Evansville at the foot of section 188, and the same number of miles from Indianapolis.

There is 48 feet of lockage on this division, in 6 locks of 8 feet lift each, bringing the level to 6.90 feet above high water, and 58.90 above extreme low water of the Ohio river at Evansville.

There are 23 small streams beside those heretofore mentioned on this division, which are passed on arches of from 6 to 10 feet chord.

The aggregate cost of this division is \$621,338 22, or \$19,416 82 per mile.

## GENERAL REMARKS.

In fixing upon a proper summit level, one which it would be necessary to maintain for a long distance, crossing the ridge between White river and Patoka, the valleys of those streams, and the ridge between Patoka and Pigeon, the relative heights of the ridges, and the general level of the valleys were only known. Many facts were wanting to

form a correct decision, which could only be ascertained by tracing a line somewhere near the ground, which would eventually be occupied. In adapting a long line of high level to a country so broken and uneven as that between the White river and Ohio, much minute and careful examination is necessary, and no route should be left unexplored that promises any improvement. The case is still more complicated and the labor increased when the level itself is to be determined from a full comparison of all the difficulties to be encountered.

A level which would give 20 feet cutting on the first ridge and 35 on the other was adopted as the one most proper, from the facts then known. As the survey progressed, however, and the character of the country became developed, it was found that a change in the level might be advantageously made. A gap in the ridge between Lost creek and Pigeon was found 20 feet lower than the lowest heretofore discovered. This, together with the facts previously ascertained, made an entire change in the level necessary. In addition to this, immediately after leaving the Pigeon summit, another question of great importance arose, materially affecting the cost and final position of the line. From this point the Main Pigeon bears very much to the east of a direct line to Evansville, and although the natural route for a canal would unquestionably be to follow its valley, yet the increase of distance would be so great it was desirable that some route might be found which would cut off this great bend without increasing to any great extent the aggregate cost. Several routes were proposed, one of which bid fair to accomplish the object in view. This was to pass up the valley of the Hurricane Fork, which runs in a northerly direction to the Muddy Fork, and at its head connects with the Blue Grass, running in an opposite or southerly direction into the Main Pigeon six miles above Evansville. The merits of this route, however could not be tested without a survey, and as time would not permit an examination of this, and of the route down the main valley, it was after much reflection, deemed proper to examine the shortest route, leaving the longest, but most natural and cheapest to be examined and adopted in case the first should be found inexpedient. The distance saved by this route will not vary far from eight miles, but the survey has shown that notwithstanding this saving it is not an object of sufficient importance to warrant the greatly increased cost. Had time permitted, it would have been more satisfactory to re-survey the whole line from the East Fork to Main Pigeon, but as such was not the case, it was thought best to proceed to the Ohio. Under the circumstances, therefore, the survey between those points can only be considered a random one, disclosing many important facts in relation to the country, and indicating the proper position for a corrected line.

It was supposed in the early part of the season, that it would be necessary to supply the summit level either by a feeder from the East Fork or from the Patoka, but the examinations have disclosed the fact that it is not only practicable, but will be the better plan to rely entirely upon the West Fork.

The question as to the proper point for the introduction of the last



feeder, involved considerations of great importance in relation to the line, and required more time than was allowed, for a full examination of the whole subject. By introducing it sufficiently high up the river, to command the prairie country lying between the north line of Davies county and the Vincennes road, the line could be made more direct and with less expense, than by being compelled to swing nearer the river, which here bears very much to the west, and presents an unusual number of short bends and narrow peninsulas. It might also in that case, be found expedient to drop the canal into the pool of the feeder dam, above Bluff No. 20, and by constructing a tow path along the margin of the river, make slack water navigation to the guard lock below. This would materially lessen the cost of the two Bluffs, 20 and 21. On the other hand it was important to shorten as much as practicable, the line to be supplied by the last feeder, and this could only be accomplished by introducing it further down the river. For these reasons it was thought best to defer a decision of the question until more minute examinations could be made, and to estimate the cost of a dam and guard lock, together with an additional sum for extra cutting and attendant expenses, which would not be likely to vary much in whatever way the question might be determined.

It is therefore at present proposed to introduce the last feeder on section 93, about 32 miles above the crossing of the East Fork, and 95 above Evansville. As the supply is abundant, the principal difficulty that exists, is to give such capacity to the upper portion of the canal that the lower part may be supplied without creating an objectionable velocity in the water above. The last 50 miles of the Ohio canal is supplied by one feeder from the Scioto river; and although the capacity of the canal is not increased, and there is a large amount of water constantly wasted at the termination and at the waste weirs, the navigation is in no manner impeded by the current. An average velocity of half a mile an hour in a canal of ordinary dimensions, would be sufficient to pass the requisite amount of water through a distance of 95 miles. A current so gentle as this, could scarcely be objectionable, especially where as in this canal, the heaviest trade would be *descending*; and it might further have the advantage of constantly renewing the water in the canal and thereby preventing any tendency which might otherwise exist to stagnation. To obviate any difficulty, however, which may arise on this account, an enlargement of 4 in width of the canal is estimated to the crossing of the East Fork, and a fall of two feet in the bottom through the whole of Division No. 4, making about 2-3 of an inch to the mile. Another objection which lies against supplying so long a line by one feeder, is the length of time required to fill it in case of a breach. This may in part be obviated by constructing at suitable points on the line conveniences for arresting the water, which may be so contrived at small expense, as to be placed across the canal in a short time, should an accident occur.

During the first days of September, I estimated by measurements the amount of water in the White river, at the points selected for the first

and second feeders. The stream was a little swollen at the time by recent rains, and it had, perhaps at no time during the summer, reached its minimum discharge. The quantity passing one mile below the foot of the bluffs, agreeable to the estimate made, was 26,500 cubic feet a minute, and at the proposed site of the second feeder, one mile below the mouth of Bean Blossom, it was 33,400. Deducting from these amounts one third for the excess over the minimum discharge, and disregarding fractions, we shall have for the amount available at the first feeder 17,600 cubic feet. Allowing 100 cubic feet per minute for the supply of one mile of canal, and there will be required 3,300 feet to the next feeder, leaving 14,300 feet for hydraulic purposes. Making use of the same data for the calculation between the second and third feeders, there will be required to supply 43 miles of canal 4,300 cubic feet, and deducting this from the supply, which will be 22,200, and there will remain for other purposes a surplus of 17,900 feet.

No measurment was made of the river at the proposed point of introducing the last feeder, as no doubt could exist of the supply. But throwing out of the calculation all the tributaries between the two points excepting Eel river, and allowing that to discharge 6000 feet, and the discharge of the main river to be the same at this point as at the feeder above, and it will give 28,200 feet. This would leave a surplus, allowing the length of canal to be supplied to be 95 miles, of 18,700 cubic feet. In these calculations no deduction is made at any one feeder for the quantity taken into the canal at the feeder above, as experience has generally shown that it is returned to the river before reaching the next feeder, and if there be any diminution it is too small to be taken into account.

It will be seen from the above, that after making the most liberal deduction, for any unusual quantity that may be required, and for extraordinary dry seasons, there will still be a large surplus of water available for hydraulic uses. The whole amount of lockage from Indianapolis to Evansville is 323 feet divided among 39 locks, which would average 8.41 feet each. At a velocity of half a mile an hour, a canal of ordinary dimensions would pass 5,800 feet. This amount might be passed from the Bluffs to the East Fork, but would, perhaps be too large an average for the summit level and line below. An average of 5,200 feet would be safe, and assuming the locks to be 8.41 feet lift each, this quantity would turn 13 run of 4½ feet stones at each lock.

On some parts of the line, particularly in the neighborhood of Bloomfield and in the neighborhood of Patoka, strong indications exist of extensive beds of iron ore. Time and attention to the more immediate duties of the line, would not permit an examination of the best localities, but from the specimens seen, and from information obtained from a variety of sources, there can be little doubt of the existence of valuable beds in the vicinity of the canal. In the same sections of country, limestone and coal are found, two important requisites in the manufacture of iron.

Many of the coal strata, especially where they have been opened, appear to be of good quality, while others present rather a slaty structure. But as shale is found, both above and below the coal formations it is probable, that had means been at hand to penetrate the stratum, better specimens might have been obtained in all cases. On the main Patoka, and most of its branches, coal of a very superior quality is found in abundance.

Both sandstone and limestone of various qualities abound near many parts of the line—particularly from Martinsville to the north line of Daviess county, and from the East Fork to the Ohio.

It has sometimes been found expedient to depress the levels below the high water of the river, especially at the upper end of a long level, and an increased height of the canal banks, has in some instances been estimated for several miles. The height of these banks above high water is from one to two feet taking the high water line of Jan, 1823 as the basis of the calculation whenever that could be ascertained; and the range of water in White river, reckoning from that line to the lowest known water, varies from 15 to 22 feet, from Indianapolis to a point a few miles above Eel river and from 20 to 24 from thence to the junction of the two forks.

In the early part of the season, a respectable number of the citizens on the west side of the river, requested an examination of that side, stating it to be the most favorable for the location of a canal. Circumstances did not permit a compliance with the request at that time, and the sickness of the party and other causes, have prevented any further examination this season, than that of measuring the bluffs; and as these form a prominent obstacle, they were carefully examined and measured from Washington to Indianapolis. They are eighteen in number, and their aggregate length 182 chains or 24 miles.

In making out the estimates of cost, I have endeavored in all cases to calculate ample *quantities*; and there is reason to believe, upon a permanent location of the line, that in improving its shape, and adapting it more nicely to the face the country, these will be reduced rather than augmented. The *prices* have been graduated as nearly as possible to the state of the currency, the character of the work, the facility for procuring materials, and the state of improvement of the country through which the line passes, and will, I think, be found sufficiently high to cover the rate at which the work may be let to substantial contractors.

As was before remarked, the route by the summit of the Hurricane and Bluegrass forks of Pigeon, was surveyed in the hope of so far shortening the whole distance, as to make it the preferable one, notwithstanding its greater cost. This hope, however, was not sufficiently realized to warrant me in recommending it for adoption. From the knowledge of the country gained during the examinations, and from a comparison of all the difficulties to be encountered between the East Fork of White river and the Ohio, I would beg leave to suggest as the cheapest and best plan, to elevate the summit level about three feet,



and maintain it until after crossing the Patoka, then to lock about eight feet, cutting a little deeper through the Pigeon summit, but saving much heavy embankment across and down the Patoka valley; and from the south side of that summit to pass down the main valley of Pigeon to the present line near Evansville. I made a partial reconnaissance of this valley on my return, and have no hesitation in saying that a canal of the cheapest kind can be constructed there.

I cannot close this report of the labors of the season, without acknowledging my indebtedness to Mr. Samuel C. Bradford, Assistant Engineer, for the services rendered by him both in the field and in camp. His assiduity and close attention to the business of the line, and his sound judgment and discretion merit my warmest thanks. I cannot forbear also an expression of regret for the loss of Mr. Royal Littlefield, surveyor, who fell a victim to the diseases of the country in September. His ambition and perseverance bid fair to have made him a valuable public servant.

### RECAPITULATION.

#### *Cost of the Line as Surveyed and Estimated.*

Division No 1, with ten per cent. added for Superintendence and Contingencies				
	17	miles.	\$225,216	60
Do No. 2,	do	33	"	366,032 52
Do No. 3,	do	69.45	"	629,601 37
Do No. 4,	do	36.55	"	800,097 21
Do No. 5,	do	32	"	621,338 22
<hr/>				
		Total miles	183	Total \$2,642,285 92
Average cost, \$14,054 71 per mile.				

#### *Cost of the Line down the valley of Main Pigeon.*

Divisions No. 1, 2, 3, and 4, as above		156	miles	\$2,020,947 70
"	No 5, which will probably be lengthened 6 miles, and which may be safely estimated at \$10,000 per mile	38		380,000 00
<hr/>				
		Total miles	194	Total \$2,400,947 70
Average cost, \$12,376.02 per mile.				

Whole amount of lockage from the plain of Indianapolis to the plain of Evansville, 328 feet; number of locks 39; and lockage per mile 1.75 feet.

From Indianapolis to the forks of White river, the fall of the river is 280 feet; distance by canal 125½ miles or 2.33 feet fall per mile. Distance by the river, 178 miles, and fall per mile 1.57 feet.

The total length of bluffs requiring protection is 442 chains or 5½ miles.

For a more particular account of the work and cost of each division, I beg leave to refer to the abstracts herewith annexed. For

more convenient reference and calculation, the sections are divided into lengths, varying but one or two chains from a mile each, so that the number of the section expresses its distance in miles from Indianapolis.

All of which is respectfully submitted.

FRANCIS CLEVELAND.

*Civil Engineer.*

Indianapolis, Dec. 12, 1835.

**ABSTRACTS OF THE CENTRAL CANAL, South of Indianapolis.**  
*Division No. 1—17 miles—From Indianapolis to the foot of the Bluffs  
at Port Royal.*

No. Sec.	DESCRIPTION.	COST.
1	Locks 1 and 2, lift 10 feet each, Pogue's Run.	26,860 66
2	Wet prairie, single bank.	5,960 82
3	Pleasant Run, wooden arch.	16,069 03
4	Plain.	10,616 75
5	Lick creek, wooden arch.	8,343 66
6	Lock 3, lift 10 feet.	13,124 51
7	Plain.	4,337 63
8	Buck creek, dam 60 feet.	6,193 68
9	Lock 4, lift 9 feet. Foot of "Big Hill."	13,314 29
10	Pleasant run, Aqueduct 1 reach.	6,336 44
11	Lock 5, lift 8 feet.	10,758 77
12	" 6, " 8 " Honey creek, arch 20 feet.	14,588 97
13	" 7, " 8 "	9,868 23
14	Plain.	4,116 09
15	" 8, " 8 " Head of Bluffs.	10,823 19
16	" Centre of do.	14,662 17
17	" 9 " 10, Dam and Guard Lock.	28,767 47
Lockage 81		\$204,742 36
Add for superintendence and contingencies 10 pr. ct.		20,474 24
Total		\$225,216 60
Average \$13,248 03 per mile.		



**ABSTRACTS OF THE CENTRAL CANAL, South of Indianapolis.**  
*Division No. 2—33 miles—From head of Section 18 to foot of Section 50.*

No. Sec.	DESCRIPTION.	COST.
18	Plain.	4,815 87
19	do.	5,084 64
20	Lock 10, lift 6 feet. Crooked creek, dam 40 feet.	10,427 04
21	Plain.	5,899 36
22	Stott's creek, aqueduct 2 reaches.	7,835 35
23	Plain.	4,163 36
24	Lock 11, lift 10 feet. G. Stafford's farm.	10,342 31
25	Clear creek, arch 18 feet.	3,269 68
26	Bluff No. 2.	21,255 09
27	Lock 12 " 10 feet.	12,054 54
28	Bluff No. 3.	8,018 87
29	Plain.	5,639 27
30	do.	8,299 66
31	do.	4,987 73
32	Lock 13 " 10 feet. Martinsville.	10,372 44
33	Plain.	2,981 14
34	do.	3,972 59
35	Indian creek, 2 stone arches.	10,934 39
36	Glade.	4,623 95
37	Little Indian creek, arch 18 feet.	10,576 53
38	Lock 14, " 10 feet. Bluff No. 4.	14,828 96
39	do. No. 5. Deer creek.	8,310 35
40	Plain.	5,006 00
41	Lock 15, " 8 feet.	3,904 65
42	Bryant's creek, arch 16 feet.	7,302 16
43	Lock 16, " 8 feet.	9,307 44
44	Bluff No. 6.	11,985 21
45	do " 7. Big branch, arch 16 feet.	17,087 64
46	Lock 17, " 8 feet. Bluff No. 8.	12,224 41
47	Bluff No. 9. Bluff creek, arch 12 feet.	11,963 39
48	Plain.	4,754 72
49	Lock 18, " 8 feet. Bean Blossom, aqueduct 3 reach.	20,000 00
50	do. 19, " 9 " Bluff No. 10, Dam and G. Lock.	40,478 20
Lockage 87		\$332,756 84
Add for superintendance and contingencies 10 pr. ct.		33,275 68
Total		\$336,032 52
Average \$11,091 89 per mile.		

**ABSTRACTS OF THE CENTRAL CANAL, South of Indianapolis.**  
*Division No. 3—69.45 miles—From the head of Section 51 to Station 3186 on Section 120.*

No. SEC.	DESCRIPTION.	COST.
51	Bluffs No. 11 and 12.	14,972 94
52	Plain.	7,513 09
53	Bluff No. 13.	8,857 52
54	do. " 14 opposite Brintonsville.	14,202 74
55	McCormick's creek, arch 18 feet.	7,313 00
56	Plain.	3,918 39
57	Bluff No. 15, opposite Spencer.	6,621 74
58	Plain.	2,958 07
59	Bluff No. 16.	8,020 27
60	Plain.	3,933 47
61	Lock 20, lift 8 feet.	9,154 18
62	Plain.	4,446 73
63	do.	5,306 10
64	do.	5,588 07
65	do.	3,691 93
66	Lock 21, " 8 feet. Bluff No. 17.	15,632 94
67	Plain.	3,485 95
68	do.	5,391 72
69	Raccoon creek, aqueduct 1 reach.	13,211 78
70	Plain.	4,712 65
71	Lock 22, " 8 feet. Bluff No. 18.	12,557 52
72	Jack's creek, arch 16 feet	6,303 04
73	Jim's creek, " 12 "	9,792 89
74	Plain	6,757 69
75	do	3,919 32
76	do	4,676 19
77	do in Glade	4,085 67
78	do	6,159 20
79	Lock 23, lift 10 feet	11,779 73
80	do 24, " 8 " Bluff creek, arch 12 feet.	12,937 62
81	Plain	4,605 20
82	do	5,699 60
83	do	7,071 87
84	do opposite Bloomfield	5,906 58
85	Lock 25, lift 8 feet. Bluff No. 19	17,179 85
86	Plain	4,555 37
87	Richland creek, aqueduct 2 reaches.	15,985 03
Lockage 50 Carried forward		\$288,911 65

*ABSTRACTS OF THE CENTRAL CANAL, South of Indianapolis.*  
*Division No. 3—Continued.*

No. Sec.	DESCRIPTION.	COST.
	Lockage 50 Amount brought forward	\$288,911 65
88	Bluff No. 20	16,797 13
89	do " 21	14,811 57
90	Lock 26, lift 8 feet	10,764 75
91	Doan's creek, arch 18 feet	8,670 34
92	Plain	5,247 03
93	Bluff No. 22, Dam & G. Lock	28,551 90
94	Plain	10,287 45
95	Slinkard's creek, arch 24 feet.	13,895 43
96	Plain	6,318 04
97	Lock 27, " 10 "	13,638 46
98	Plain	3,111 03
99	do	3,036 73
100	do	4,043 31
101	Lock 28, " 11 feet	16,548 77
102	Plain	4,604 10
103	do	3,390 18
104	do	5,327 01
105	Lock 29, lift 7 feet. Smother's creek	17,053 48
106	Plain	3,769 00
107	Lock 30, " 6 "	11,086 72
108	Plain	3,191 40
109	do	3,843 52
110	Lock 31, " 6 "	13,132 66
111	Plain	2,913 15
112	do	2,910 58
113	Prairie creek, aqueduct 2 reaches.	9,387 68
114	Plain	5,746 17
115	Lock 32, " 6 "	9,227 94
116	Plain	4,465 78
117	do	4,667 46
118	Bluff No. 23	7,641 22
119	Plain	7,272 27
120	Lock 33, " 8 "	8,100 78
	Lockage 112	\$572,364 70
	Add for superintendance and contingencies 10 pr. ct.	57,236 47
	Total	\$629,601 17
	Average \$9,065 53 per mile.	



**ABSTRACTS OF THE CENTRAL CANAL, South of Indianapolis.**  
*Division No. 4—36.55 miles summit level—From Station 3186 to head of Section 157.*

No. Sec.	DESCRIPTION.	COST.
120	Veal's creek, arch 30 feet	12,966 77
121	Bluff No. 24. Evans'	7,777 37
122	do " 25	6,555 90
123	Plain	8,660 21
124	Heavy embankment	19,833 61
125	do do	30,151 86
126	East Fork of White river, aqueduct 8 reaches	60,975 37
127	Plain	5,700 52
128	Bluff No. 26, Lick creek, arch 12 feet	19,195 42
129	Plain	9,061 14
130	do	8,604 00
131	Bluff No. 27. Mouth of Pride's creek	16,492 67
132	Plain	7,183 08
133	Pride's creek, arch 20 feet	6,815 72
134	Ascending summit	10,697 80
135	do	95,070 60
136	Descending do	60,159 60
137	Plain	6,555 30
138	do	4,457 61
139	do	7,356 50
140	do	8,933 56
141	Patoka river. Aqueduct 3 reaches	74,427 42
142	Plain	11,274 17
143	South Fork of Patoka, aqueduct one reach	31,210 09
144	Heavy embankment	22,873 02
145	Plain	6,927 11
146	do	6,506 71
147	do	6,392 49
148	do	7,737 55
149	do	5,769 80
150	Keg's creek, arch 16 feet	31,489 56
151	Plain	27,657 83
152	do	13,158 58
153	East Fork of Lost creek, 12 feet arch	5,699 64
154	Plain	6,473 20
155	Pigeon summit	45,428 94
156	do do descending	11,130 38
		<hr/>
		\$727,361 10
Add for superintendance and contingencies 10 pr. ct.		72,736 11
		<hr/>
Total		\$800,097 21
Average \$21,890 48 per mile		

**ABSTRACT OF CENTRAL CANAL, South of Indianapolis—Di-  
Division No. 5—32 Miles.**

No. Sec.	DESCRIPTION.	COST.
	From head of Section 157 to Evansville.	
157	Plain	5,682 79
158	Dry and Clear Forks of Pigeon, arches 16 & 20 ft.	22,521 22
159	Plain	9,566 14
160	Plain	11,828 55
161	Heavy Embankment	20,040 24
162	Heavy Embankment	18,092 03
163	Muddy fork of Pigeon, arch 20 feet.	53,123 03
164	Plain	8,347 36
165	do	8,617 73
166	do	8,693 17
167	do	5,054 98
168	Ascending Hurricane summit	8,173 40
169	do do do	34,274 34
170	On summit	174,578 83
171	Locks 34 and 35, 16 feet	26,689 92
172	do 36 and 37, 16 "	15,607 28
173	do 38 8 "	10,504 83
174	Plain	3,707 47
175	do 39 3 ft. Mid. f'k of Pigeon arch 20 ft.	13,246 51
176	Plain	4,752 25
177	do	8,282 52
178	Little Bluegrass, arch 16 ft.	7,729 52
179	Plain	3,969 09
180	do	10,167 37
181	Lick branch, arch 14 feet	12,630 44
182	Main Pigeon, aqueduct 3 reaches	22,045 83
183	Plain	8,095 28
184	do	5,311 07
185	do	7,252 11
186	do	4,213 08
187	do	6,084 03
188	do	5,970 48
	Lockage 48	\$564,352 94
	Add for superintendence & contingenc's 10 pr. ct.	56,485 29
	Total	\$621,338 23

Average \$19,416 82 per mile.

NOTE.—This division should be considered as passing down the valley of Main Pigeon, and may be safely estimated as 38 miles, at \$10,000 per mile—\$380,000 00.

*To David Burr, James B. Johnston, and Samuel Lewis, Canal Commissioners of Indiana,*

GENTLEMEN:—In compliance with instructions communicated to me by Col. Burr, I have made a survey, location, and estimate of the contemplated extension of the Wabash and Erie Canal from Lafayette to Terre-Haute on the east side of the Wabash river, and now proceed to lay before you the result of my labours.

For the convenience of reference and to show the cost of particular portions of the work, I have divided the line into stations of three chains each, and into sections of one mile each; and numbered them from the place of beginning. The locks and other mechanical works, have also, and for the same reason, been numbered, and estimated separately. The feeders have not been numbered; but will be known by the names of the streams from which they will be supplied with water.

Upon the 15th June last, having organized my party and made the necessary arrangements, I commenced operations at Lafayette, at the 3061st station of the upper division; and proceeded downwards towards Terre Haute.

The ground generally upon this division, is remarkably favorable for the construction of a canal. The line uniformly extends along just at the foot of the river bluff, and at the margin of the river bottom; where for a considerable portion of the distance, only one bank will be required—the bluff answering for the other. This, at the same time that it gives us a very cheap canal, enables us to make it wide and deep, which is an important consideration. Where we have excavation, the soil is mostly a sandy loam, and very easy of excavation. In some few instances the ground is wet and swampy; but where this is the case it can be drained without much expense. The most difficult place of this kind, is in the rear of Silver Island, just above the mouth of Coal creek. The line here, for a distance of four miles, lies entirely in a deep swamp; but, every thing considered, I am decidedly of opinion that it is the best route which can be found. In the first place, it is undoubtedly much the shortest; and what is of still greater importance, it enables us to avoid Coal Bank Bluff, which is said to be a mile in length, and which would be one of the most difficult and expensive passes upon the whole line. This swamp can be drained at both ends—at the upper end thro' what is called the "Wolf Trap"—a sort of natural gap, or opening from the swamp to the river bottoms, just at the head of the island; and at the lower end, by a ditch extending along parallel with the canal, and opening in the low grounds near Coal creek.

Some times we were obliged to keep up the level higher than was desirable—to enable us, in some cases to cross streams with aqueducts; and in others to keep above the floods of the river. In these places we have high embankments; but the location, as I said before, being generally near the bluffs, we rarely have more than one bank to construct; and tho' it be high, yet the amount of embankment required is comparatively small. The grubbing here will be less expensive,



where the amount of timber is the same, than on other portions of the line, and for this reason: it will only extend to the puddle ditches, under the bank; whereas in common cases, and particularly where there is excavation, the whole width of the canal has to be grubbed off:—so that upon the whole, the canal will not cost much more in these places, than where we have ordinary excavation, or embankment. I speak of this the more particularly, lest it might not be understood by those who were unacquainted with the circumstances, how these points of high embankments could be passed with so small an expense.

The material for our embankments, generally will be procured from the bluffs, which are composed principally of loose sand and gravel; and as the distance to be removed is short, the work can be done correspondingly cheap.

The most serious difficulty to be encountered is the passage of the bluffs that occur, where the river extends up to the foot of the bank; and where the canal will have to be constructed in the river, and the outside protected with wall. Of these there are five, viz: the first on the 3d and 4th sections—the second on the 31st at Portland—the third on the 32d and 33d at Capt Wyckoff's—the 4th on the 80th, and the fifth on the 90th, a little above Terre Haute. The different lengths of these bluffs are given in the estimates. At the fourth and fifth, stone for the protection wall, will have to be hauled from a considerable distance; and at the first there is none nearer than 25 miles, unless some new quarries shall be discovered, which I think is not very likely. There is however a species of conglomerate here, which when fairly uncovered may be found to be sufficiently solid for this purpose. I would not however depend upon it, unless it might be for the bottom of the wall, where it would not be exposed to the influence of the air. This protection might undoubtedly be made to answer present purposes, somewhat cheaper with brush or timber; and procure stone afterwards by the canal. I am however of opinion, that if to this cost, we add the cost of the brush or timber, we shall find there will be very little gained by the process; particularly when we consider, that stone can now be procured by water up the river, in boats.

At Portland and Capt. Wyckoff's, stone is abundant—Indeed, at Portland, the Bluff is principally composed of stone, where it can be easily procured, and floated down for the work below.

The whole amount of descent upon this division is sixty eight feet; which is overcome by seven locks—six of ten feet lift, and one of eight feet lift. These I propose to construct of stone, notwithstanding one of them (No. 1,) is 24 miles distant from the nearest quarry. At first I thought it best to use timber for this lock, because I was fearful that stone would be altogether too expensive. But when I considered that it could be procured by water up the river in boats, I was led to make an estimate of the cost. In doing this, I was governed in some measure, by the prices paid in similar cases in Pennsylvania. I subjoin the estimate, that the board may judge of its accuracy.

I have supposed that the stone might be quarried and delivered in the boat, at 75 cents per perch of 25 cubic feet, (the distance is about  $\frac{1}{4}$  of a mile.) This in ten perches, which is about a boat load, comes to

\$7 50

This load, judging from the performance of boatmen on the Ohio river, can be pushed up by seven men, and the boat returned in three days. The wages of men will not exceed 75 cents per day, including board &c. & am'ts to

15 75

The boat itself is worth, say 1 dollar per day

3 00

Cost of delivering from river bank to lock.  $37\frac{1}{2}$  cents per perch

3 75

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\$30 00

Thus we have the cost of delivering equal \$3 00 per perch.

A lock of 90 feet chamber, and 10 feet lift, will contain about 1,300 perches. This at three dollars per perch, amounts to \$3,900 00.—The cutting I put at one dollar per perch. This is upon the supposition that the cutting will cost 20 cents per foot face, and that there will be five cubic feet of wall to one square foot of face. This then comes to

\$1,300 00

The laying will not exceed one dollar a perch, including the hauling in of the stone, and attending mason &c. &c.

1,300 00

Timber for foundation, gates &c. say 5,500 feet which can certainly be delivered in the lock at ten cents

550 00

Plank 25,000 feet board measure at 3 cents

750 00

Wrought Iron 7,000 lbs.

at 15 "

1,050 00

Lead

200 "

at 10 "

20 00

Cement (Roman) 6 barrels

\$ at 24 00

144 00

Lime

1,300 bushels

at 15 cents

195 00

Paddle gates (8)

150 00

Lockets and gudgeons

30 00

Cast iron clamps for spindle rods (24)

25 00

Sand

2,600 bushels

at 2 cents

52 00

Rubble wall below wings 72 perches at \$3 50

252 00

Painting gates, balance-beams &c. &c.

50 00

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\$9,768 00

This does not include the excavation for the foundation, the puddle nor the embankment; but it is intended to, and I believe does include every thing else. The above prices in Pennsylvania, would be considered high; for instance, on the Pennsylvania and Ohio canal, I know one contractor, who is getting his stone quarried, and delivered by water upon the Beaver canal—a distance of seven miles, for  $87\frac{1}{2}$  cents per perch; and I know other responsible contractors, who have engaged to construct slope wall for less than 50 cents a perch, where the stone have to be quarried and hauled more than a mile. Wrought iron here, for locks, is worth 9 cents—timber 8 cents per foot, laid in the work—lime 10 cents delivered—plank  $1\frac{1}{2}$  cents laid, and other things in the same way. Now, if work in Indiana does not cost a good

deal more than it does in Pennsylvania (and it certainly ought not) then my estimate for Lock No. 1, (1,000 dollars per foot lift) will cover these three items, of excavation, puddle, and embankment. I fully believe, myself, that it will. This is about 3,000 dollars more than our locks on the Beaver division of the Pennsylvania canal cost, and it is indeed a high price; but when it is considered how perishable a material wood is, and how liable structures composed of it are to decay and get out of repair, and the great damage consequent thereon to the public and to individuals; and particularly when it is considered that this is the only lock about which there can be any doubt as to the propriety of using stone, it seems to me that we ought not to hesitate about the cost.

In works of this kind, which are destined as the canal of which this is a part undoubtedly is, to become one of the most important links between the North and South—upon which so extensive, rich, and productive a district of country depends; and upon whose surface, in the course of a few years, there will undoubtedly float as extensive a business as is done upon any other canal in the Union—surely safety and durability, ought to be considered of the most primary importance.—Without these our public works can have no reputation. The people will continue to do their business in the old fashioned way—by means of wagons and carts; and we shall find, when it is perhaps too late, that, we have expended millions of money and imposed a heavy burden upon the people, without effecting any useful purpose. Impressed, as we all are, with the truth and importance of these facts and considerations, it is rather a discouraging reflection that, notwithstanding all this, and with all our experience and vigilance, we still rarely get our public works so safe and permanent as we could wish. It is nevertheless true, that in this respect we are gaining every year; and it is to be hoped, that as the science of Engineering advances, and we acquire more *practical* knowledge, that we shall be enabled to overcome most of the difficulties with which we have heretofore had to contend.

I now proceed to the consideration of the aqueducts, of these we have nine, viz: the first at Durkey's run about a mile below Lafayette—2d at the Wea—3d at Shawnee creek—4th at Bear creek, near Portland—5th at Coal creek—6th at Sugar creek—7th at Raccoon creek—8th at Spring creek, and the 9th at Otter creek. These are all estimated to be made with stone abutments and piers, and timber superstructures. I have done this for the reason, that in no instance can we carry our level high enough, to admit of stone arches of sufficient dimensions for the passage of the streams at flood times; and besides in aqueducts of short spans, made in the simplest manner, without any truss or arch work to support them, which is the case here, with but one exception; and where they are kept full of water, as they may be, except occasionally when it becomes necessary to repair the canal, they will rarely get out of repair, and will not decay in a great number of years. When they do want repairs, the structures are so simple, that any carpenter can repair them; and they may



generally be made in the winter season, when the canal is not in use. At sugar creek the arches of the aqueduct are to be 80 ft. each, which was thought necessary on account of the remarkably high floods, to which this stream is subject; and the great quantity of flood wood which it brings down. The principal difficulty in aqueducts with short spans, is, that the trees which are brought down by the floods, many of which are long enough to reach from pier to pier, soon form a kind of dam, and choke up the waterway, by which the pressure becomes so great, as either to carry off the aqueduct, or undermine the piers and abutments, by occasioning an increased current at their bases.

We have six dams of different heights and lengths, as will be seen in the estimates. The abutments are to be stone and the body of the dam of timber, laid up in crib work and filled with stone. The upper slope, on gravel foundations, is to be as  $1\frac{1}{2}$  to 1—the lower slope as 5 to 1. Both of these slopes are to be covered—the one with plank—the other with timber and the upper slope, when the wood work is completed, is to have a thick covering of gravel. The dam at Sugar creek will be on rock, and the slopes in this case will be as  $1\frac{1}{2}$  to 1, both above and below.

We have twelve culverts; of which five are estimated to be made of stone, and seven of wood. A wooden culvert, situated as ours are, so as to be continually covered with water, is quite as good as stone; and costs much less money. We propose to build none of this material except those of the smallest class. The stone culverts are to be semicircles—the rims of the arches to be two feet thick, and placed so low as never to have less than three feet of puddle on their tops.

There are a number of streams upon this line, which are too high to be passed under the canal by means of culverts, and have to be taken in, with suitable wiers to discharge their floods, of these wiers we have 12, which are to be constructed entirely of timber, in the simplest, but at the same time in the most substantial manner. Besides these we have seven lock wiers—one to each lock; the object of which, is to pass the feed water, round the locks, from one level to the other. They are also to be made of wood, with a sliding gate at the head of each to regulate the discharge of water.

It will be perceived from the estimates, that I have provided for a number of bridges. This has not been done except where public roads cross the canal, and here I thought it was likely the board would construct bridges. If I am mistaken in this, it is easy to strike them from the estimates. They are to be constructed entirely of wood, and upon the simplest and cheapest plan.

The feeders are four in number, viz: the Wea—Shawnee—Coal and Sugar creeks. They are to be of the same size as the canal; that is, 28 feet at bottom 40 feet at top, and 4 feet deep; except the Shawnee feeder, which is to be 10 feet at bottom, and the slopes of its sides like the others. Upon this plan, as the feeders will be constructed just at the margin of the creek bottoms, and immediately adjoining the hills or bluffs, where but one bank will generally be needed, they will cost but little more, than if they were narrower; and they will

have several advantages, which I think will more than compensate for the difference of expense. Among these, one is, that they will admit a large quantity of water, which if thought proper may be disposed of for hydraulic purposes; and thus become a source of revenue to the state, as well as a great convenience to the surrounding country. They will also make a safe, out of the way place, for the loading and unloading of boats, which operation is often a serious interruption to the main canal. They may also be navigated. The farmer will find them convenient for bringing down his corn, lumber &c &c; and it may be desirable sometimes, to run up them to procure materials for repairs &c. In their construction, 4 mills will be destroyed—one at each feeder. Three of these, are saw-mills—at the three upper feeders; and the other, at Sugar creek, is a grist mill. The one at the Wea, belongs to James Hawkins—that at Shawnee, to Winans & Piatt—that at Coal creek to John Underwood, and that at Sugar creek to Mr. Manwarren. The sites are generally good ones, but the mills appear to be out of repair, and I think are not very valuable.

Upon the subject of water upon this division, I have to remark, that in regard to a supply for that portion of it, lying between Lafayette and the Wea creek, as it evidently had to be drawn from some source on the upper division, and as my instructions did not authorize me to extend my examinations in that direction, I left the matter entirely to Col. Burr, who assured me, that the Wild Cat would be amply sufficient, not only for the line to which it particularly belongs, but also for that just mentioned. On passing downwards, and while at the Wea and Shawnee creeks, the streams were so high, that no certain estimate could be made, as to what they would yield in the driest times. I did not therefore gauge them, but intended to do so, whenever a suitable time occurred. Both of the other feeders, viz: Coal and Sugar creeks, being at their lowest stages, or nearly so, at the time we crossed them, were carefully gauged.

NOTE.—Raccoon creek can also be easily taken in as a feeder, but as there is an abundance of water in the other two streams without it, no calculation has been made for that purpose.

After I had terminated my survey at Terre Haute, I was about to return to the other two streams, but was prevented by sickness. Myself and whole party, with one exception, within the space of a few days, were taken down, either with fever and ague, or bilious fever; which wholly unfitted us for any further field operations during the remainder of the season. I had therefore to request Col. Burr to send some skillful persons to gauge those two streams for me, which he did accordingly, and sent me the results, together with the gauging of the Wild Cat.

The following are the amounts which each of the streams to be used as feeders upon this line, will supply, viz:

Wild Cat	4,495	cubic feet	per minute.
Wea	1,676	"	"
Shawnee	1,341	"	"
Coal creek	2,925	"	"
Sugar cr.	10,500	"	"

The quantity of water which it is supposed will be required to supply the filtration and evaporation of a canal, has been variously estimated; by some, I believe, as low as 27 cubic feet, and by others, as high as 100 cubic feet per minute for each mile. It is very evident, however, that the quantity must depend on circumstances—the situation of the canal—the manner of its construction, and the nature of the soil of which it is composed. If the canal have a northern exposure there will be much less evaporation than in a contrary situation, where it would be exposed to the direct rays of the sun. If the soil be clay it will hold water better than gravel or any coarse material; and if the canal be carelessly constructed, we cannot of course expect it to hold water. And it may frequently happen where water is abundant, that a coarse and porous material may be used with great propriety, as long as the strength and safety of the bank is secured, particularly where a finer material is not handy, and would be procured at a great expense.

Here the soil will generally be tight, and favorable to the holding of water. In some places we pass through clayey bottoms, and in others over swampy ground or wet prairies; but the most favorable circumstance is, that on a large portion of the line, and particularly between Lafayette and Sugar creek, there are a great number of springs and spring brooks coming in, sufficient, I have no doubt, to supply the evaporation and filtration. Upon this subject however, I cannot of course speak with any great certainty, as we do not know the quantity derivable from these sources; but I feel quite sure that we may safely estimate the quantity for this portion of the line, at 50 cubic feet per minute, for each mile, to supply the evaporation and filtration. The quantity necessary for the lockage and leakage, will depend, the one on the amount of business done upon the canal, and the other on the tightness of the gates. This last circumstance, however, we can in a great measure controul, but not altogether; so that some allowance must be made for it. Let us now see what distance we have to feed, and the amount of water we have to feed it with. From the Wild Cat (the first feeder), down to lock No. 4, is 50 miles, which will require 2500 cubic feet of water per minute, and as we have 7512 cubic feet to draw upon, furnished by the Wild Cat, Wea and Shawnee, there will remain unexpended 5012 cubic feet applicable to other purposes. A lock of 10 feet lift and 90 feet by 15 in the chamber, will contain 13,500 cubic feet; and it will take a lock full of water for every boat that passes. Now suppose the exigencies of the business to require the maximum use of the locks; or say the passage of a boat every five minutes; the quantity of water exhausted in an hour would be 162,000 cubic feet. But the sources of our supply will yield in the same time 300,720 cubic feet, nearly double that amount, thus leaving 138,720 cubic feet for the leakage at the gates, and for hydraulic purposes; which will be found amply sufficient for the one, and for the other to a valuable extent. Upon the remaining portion of the line, which is not quite half the whole distance, we have almost double the quantity of water, namely 13,425 cubic feet per minute. It should however be remarked, that at the time we gauged Coal and



Sugar creeks, we were a little suspicious that the water was not down to its lowest stage, although we were assured it was by the people who lived immediately in the neighborhood. We became confirmed in this suspicion, by observing a day or two after the gauging, that the water had slightly subsided; but it was very little, and we did not think it would decrease so as to affect the streams to more than one fifth of the amount, which they then furnished. Admitting this to be the case, and we shall still have in these two streams, 10,740 cubic feet of water per minute, which, it is not necessary to say, is altogether abundant.

While at Terre-Haute, and before I became so unwell, as to be unable to attend to business, I discovered that a number of the inhabitants were desirous that the canal should not terminate where we run it, just at the foot of the bluff in front of the town—but that it should be carried along in the rear of the town through the valley of Lost creek. For the purpose of ascertaining the practicability of this plan, I had a level run over the route, by which it was found, that by keeping up the 7th lock, which can be done without any particular inconvenience, the cutting would not exceed in the deepest place, 19 feet.

I owe an apology to the Board, on account of not having sent in this report at an earlier period. In another place, I alluded to a sickness which attacked myself and party, and prevented us from attending to some field operations, which were afterwards performed under the direction of Col. Burr. To this sickness I have to ascribe the above mentioned delay. For three weeks, while at Terre-Haute, I was constantly confined to my bed with severe and painful indisposition; and when I began to get better, (as I did at several times), I was as often prostrated with relapses of the same complaint; until at length I became satisfied that I could not expect to recover, or at any rate not very soon, while I continued to breathe the same kind of air which had induced the disease. In this opinion I was confirmed by my physician; and I therefore determined to return as soon as possible to Pennsylvania, in the hope that the exercise of travelling, and a change of air and climate would gradually restore me to health. In this I was not disappointed. I recovered rapidly, and continued very comfortable, until within the last few weeks, when I was again visited with a variety of the same complaint, in the form of fever and ague. This has prevented me from attending to business, and also from returning to your country, as I, at one time fully intended to do.

I know I have not done all that the Board could have wished; notwithstanding which, perhaps, I may venture to hope, that what I have done, will answer the purpose intended, and that the Board will be satisfied. This would be particularly gratifying to me.

The Board have my sincere wishes, for the prosperity and success of the great work in which they are engaged; and for the happiness and prosperity of themselves individually.

With great respect,

CHARLES T. WHIPPO.

*New Castle, Penn. Nov. 23d, 1835.*

*ESTIMATED COST of the LAFAYETTE and TERRE-HAUTE  
Division of the WABASH AND ERIE CANAL.*

**SECTIONS.**

No. Sec.	Length in Chains.	C O S T.		R E M A R K S.	
1	80	\$	6,470 79		
2	80		6,510 57	Aqueduct No. 1	
3	80		39,911 75	Bluff 21 chs. }	Total bluff 33 chains
4	80		28,112 88	Bluff 12 " }	
5	59		8,149 40	Lock No. 1—Aqueduct No. 2—Wea	
6	80		8,403 20		
7	30		4,263 71	Lock No. 2	
8	80		3,510 26		
9	80		2,777 30		
10	80		2,327 30	Wea Prairie	
11	80		2,327 30		
12	80		2,697 94		
13	80		4,285 02		
14	80		7,220 82	Flint creek—dam No. 1	
15	80		6,397 35		
16	80		3,988 22		
17	80		3,925 88		
18	80		3,585 98	Maysville	
19	80		3,846 62		
20	80		4,590 92		
21	80		3,915 90		
22	80		5,405 49		
23	80		6,210 46		
24	80		4,672 05	Attica	
25	80		5,544 99	Lock No. 3	
26	80		4,654 41		
27	80		5,473 89		
28	80		4,820 02	Shawnee—Aqueduct No. 3	
29	80		5,282 45		
30	80		4,904 26		
31	80		42,144 00	Portland bluff, 42 chains—Aqueduct No. 4	
32	80		21,625 68	Wycoff's bluff 19 chains }	Total 96 chains
33	80		57,816 40	" " 77 " }	
34	80		5,393 65		
35	80		4,052 58		
36	80		2,605 03		
37	80		2,605 03		
38	80		3,875 90		
3019			344,305 40	Carried over.	

No. Sec.	Length in Chains.	C O S T.	R E M A R K S.
	3019	344,305 40	Amount brought forward
39	80	7,404 80	
40	80	2,854 84	Covington
41	80	4,175 69	
42	80	3,578 04	
43	80	4,367 72	
44	80	4,274 06	Lock No. 4
45	80	5,062 60	
46	80	4,956 57	Perrysville on west side of river
47	80	6,353 33	
48	80	5,239 91	
49	80	3,537 66	
50	80	4,122 20	
51	80	3,915 95	
52	80	3,915 95	
53	80	3,988 43	
54	80	10,756 59	Coal creek--Aqueduct No. 5
55	80	7,027 02	Lock No. 5
56	80	5,630 58	
57	80	5,631 14	
58	80	5,168 53	Mill creek--dam No. 2
59	80	6,115 78	
60	80	7,416 47	
61	80	7,003 54	Sugar creek--Aqueduct No. 6
62	80	6,492 65	
63	80	6,181 96	
64	80	8,985 12	
65	80	5,917 12	
66	80	5,665 56	Montezuma
67	80	6,311 99	
68	80	11,408 25	
69	80	8,891 37	Armysburgh
70	80	6,355 93	Raccoon creek--Aqueduct No. 7.
71	80	6,511 42	
72	80	4,524 88	
73	80	5,941 09	
74	80	3,105 03	
75	80	3,332 58	
76	80	4,205 65	
77	80	6,898 18	Lock No. 6--Clinton, west side river
78	80	8,613 35	
79	80	7,366 28	
6299		583,511 21	Carried over



No. Sec.	Length in Chains.	COST.	REMARKS.
	6299	583,511 21	Amount brought forward.
80	80	37,375 05	Bluff 39 chains
81	80	7,261 15	Spring creek—Aqueduct No. 8
82	80	12,735 75	
83	80	9 397 65	
84	80	10,879 20	Otter creek—Aqueduct No. 9
85	80	3,362 09	
86	80	3,122 87	Lock No. 7
87	80	4,189 70	Fort Harrison.
88	80	4,477 36	
89	80	5,135 41	
90	101	19,476 11	Bluff 21 chains—Terre-Haute
	7200	\$700,924 07	Total cost—length, 90 miles.

## LOCK S.

No.	Location.	Lift.	Cost	REMARKS.
1	Sec. No. 5--Wea	10 ft.	\$10,000 00	Built of cut stone
2	Sec. No. 7	8 "	8,000 00	
3	Sec. No. 25	10 "	3,650 00	
4	Sec. No. 44	10 "	7,220 00	
5	Sec. No. 55	10 "	7,910 00	
6	Sec. No. 77	10 "	8,630 00	
7	Sec. No. 86	10 "	8,630 00	
	Total lockage	68 ft.	\$59,020 00	Total cost of Locks.

## AQUEDUCTS.

No.	Location.	Length	No. Spans.	COST.	REMARKS.
1	Durkey's run	125 feet	4	\$13,172 00	
2	Wea	215 "	6	21,429 03	
3	Shawnee	180 "	5	10,318 38	
4	Bear creek	95 "	3	11,132 02	
5	Coal creek	215 "	6	15,379 51	
6	Sugar creek	260 "	3	19,694 00	
7	Raccoon creek	215 "	6	23,626 26	
8	Spring creek	110 "	3	8,962 75	
9	Otter creek	110 "	3	10,801 26	

Total cost of Aqueducts \$134,515 21

## DAMS.

No.	Location.	Length.	Height.	Cost.	Remarks.
1	Flint cr.	200 feet.	6½ feet.	\$5,874 06	
2	Mill ceeek	100 "	9 "	6,731 46	
\$12,605 52 Total cost of Dams.					

## CULVERTS.

No.	Descript'n	Location.	Length.	Size.	Cost.	Remarks.
1	Of wood.	Sec. No. 1	120 feet.	3 f. by 3 f.	\$298 00	At Lafay't
2	" "	Sec. No. 12	107 "	3 sp. 4 by 4	875 81	
3	" "	Sec. No. 15	107 "	3 by 3	317 63	
4	" "	Sec. No. 27	107 "	3 by 3	368 88	
5	" stone	Sec. No. 32	107 "	1 ar. 3 f rad.	583 20	
6	" "	Sec. No. 39	116 "	2 " 3 f. rad	1386 20	Mud run.
7	" "	Sec. No. 41	107 "	2 " 3 f. "	1384 15	Cov'tn run
8	" "	Sec. No. 47	107 "	1 " 3 f. "	759 70	
9	" "	"	107 "	1 " 3 f. "	759 70	
10	" wood	Sec. No. 73	100 "	2 by 2	250 50	
11	" "	Sec. No. 87	107 "	3 by 3	392 63	
12	" "	Sec. No. 88	107 "	3 by 3	392 63	
\$7769 03 Total cost.						

## WASTE WIERS.

No.	Location.	Length.	Cost.	Remarks.
1	Sec. No. 17	80 feet	\$800 00	Turkey run.
2	" No. 18	100 "	1000 00	Young's run.
3	" No. 20	50 "	500 00	
4	" No. 21	50 "	500 00	Campbell's run.
5	" No. 22	50 "	500 00	Little Pine creek.
6	" No. 24	30 "	300 00	Tan Yard run.
7	" No. 39	75 "	750 00	
8	" No. 42	50 "	500 00	
9	" No. 43	50 "	500 00	
10	" No. 44	50 "	500 00	
11	" No. 44	50 "	500 00	
12	" No. 46	50 "	500 00	
\$6,850 00 Total cost.				

## LOCK WIERS.

No.	Location.	Cost.	Remarks.
1	At Lock No. 1	\$400 00	To convey the water from the upper to the lower level around the locks.
2	" No. 2	400 00	
3	" No. 3	400 00	
4	" No. 4	400 00	
5	" No. 5	400 09	
6	" No. 6	400 00	
7	" No. 7	400 00	
\$2,800 00 Total cost of Lock Wiers.			

## ROAD BRIDGES.

No.	Location.	Cost.	Remarks
1	On Sec. No. 12	\$600 00	Built entirely of wood, and the embankments included in the estimates.
2	" No. 24	600 00	
3	" No. 25	600 00	
4	" No. 37	600 00	At Covington.
5	" No. 40	600 00	
6	" No. 46	600 00	Road to Perrysville.
7	" No. 54	600 00	" near Coal creek.
8	" No. 66	600 00	Montezuma.
9	" No. 77	600 00	State Road to Clinton.
10	" No. 90	600 00	National Road. Terre-Haute.
\$6000 00 Total cost of Bridges.			

## FEEDERS, AND FEEDER DAMS.

Names.	Leng. of Feed.	Cost of Feeder.	Leng. of Dam.	Heig't of Dam.	Cost of Dam.	Total Cost.
Wea	45 ch	\$3,202 53	200 ft.	8 feet	\$7,668 00	\$10,870 53
Shawne	12	345 65	100 "	7 "	3,940 48	4,286 13
Coal cr.	156	13,068 70	100 "	13 "	6,069 66	19,138 36
Sugar cr	73	6,261 64	182 "	15 "	6,874 20	13,135 84
Tot. leng. 286 chs. \$22,868 52			\$24,552 34			\$47,430 86



## SUMMARY.

Sections	-	-	-	\$700,924 08
Locks	-	-	-	59,020 00
Aqueducts	-	-	-	134,515 21
Dams	-	-	-	12,605 52
Culverts	-	-	-	7,769 03
Waste Wiers	-	-	-	6,850 00
Lock Wiers	-	-	-	2,800 00
Road Bridges	-	-	-	6,000 00
Feeders and Feeder Dams	-	-	-	47,430 89

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\$977,914 70

Add for contingent expenses \$1000 per mile

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\$90,000 00

Total cost

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\$1,067,914 70

Average cost per mile

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\$11,865 79

Total length of Canal 90 miles.

“ “ of Feeders 3 “ 46 chains

“ “ of Canal including Feeders 93 “ 46 “



H. R.

## REPORT

OF THE

## SECRETARY OF STATE.

DECEMBER 23, 1835.

Read and referred to the Apportionment Committee.

SECRETARY OF STATE'S OFFICE  
December, 1835.

SIR—

Since my last report to the House of Representatives in relation to the census, I have received the following returns:

From the county of Daviess, including the number heretofore reported. 909

From the county of Vigo, in addition to the one heretofore communicated. 85

The clerk certifies that the collector has made no return to him under the 5th section of the act.

The clerk of Dearborn county has sent up a supplemental return correcting an error in the former one, and giving the strength of said county at 3,120 instead of 3,449, as heretofore reported.

Respectfully your obed't servant,  
WM. SHEETS.

Hon. C. B. SMITH, *Speaker H. R.*





**H. R.**

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**REPORT**

IN RELATION TO THE

**WHITE MALE INHABITANTS,**

---

DECEMBER 23, 1835.

Taken up, referred to the Select Committee on the Apportionment, and 500 copies ordered to be printed.

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SECRETARY'S OFFICE,  
*Indianapolis, 14th Dec. 1835.* }

SIR—

I herewith transmit, for the inspection of the House of Representatives, a statement of the returns from each county, of the white male inhabitants above the age of twenty-one years, so far as they have been received at this department.

I am, with great respect,

Your obedient servant,

**WM. SHEETS.**

The Hon. CALEB B. SMITH,

*Speaker of the House of Representatives.*

**A LIST OF WHITE MALE INHABITANTS** above the age of twenty-one years, in the State of Indiana, in the year 1835.

COUNTIES.	Paupers.	Insane persons.	Persons exempt from poll tax.	Persons returned by Collectors.	Persons returned to Aud'r.	Total.	
Allen	2		12	259	815	1088	
Bartholomew	(Aggregate		184	)	1346	1530	
Boone	1		41	100	729	871	
Carroll				162	811	973	
Cass	1	3	76	560	630	1260	
Clark*					1882		
Clay*					516		
Clinton	1		35	105	769	910	
Crawford	2			no return	494	496	
Daviess	(Aggregate		79	)	no ret'n		
Dearborn	2	1	733	192	2521	3449	
Decatur	1		94	42	1449	1586	
Delaware			29	164	674	867	
Dubois*					351		
Elkhart	(Aggregate		213†	)	839	1052	
Fayette	5	3		224	1559	1791	
Floyd	3		115	279	1296	1693	
Fountain	1		103	461	1334	1899	
Franklin	2		133	75	1794	2004	
Gibson				116	1138	1254	
Grant	(Aggregate		85	)	304	389	
Greene			51	109	806	966	
Hamilton	(Aggregate		210	)	841	1051	
Hancock			25	276	684	985	
Harrison	2		274		1605	1881	
Hendricks	6		81	211	1429	1727	
Henry	1		10	252	1827	2090	
Huntington				no return	259	259	
Jackson*					1144		
Jefferson	1		178	41	2222	2442	
Jennings	(Aggregate		63	)	877	940	
Johnson			60	84	1236	1380	
Knox			1	no return	1275	1276	
Lagrange		2	22	128	335	487	
Laporte†			26	167	1115	1308	
Lawrence	4	1	(	306	)	1506	1817
Madison	(Aggregate		90	)	846	936	
Marion			5	183	2220	2408	
Martin*					359		
Miami	2		2	324	323	651	
Monroe*					1270		
Montgomery	1		145	233	2005	2384	
Morgan	2			97	1281	1380	
Orange	9		154	171	1161	1495	
Owen			122	50	877	1049	



A LIST OF WHITE MALE INHABITANTS above the age of twenty-one years, in the State of Indiana, in the year 1835—continued.

Parke			125	238	1668	2031
Perry	1		29	27	558	615
Pike	1		( 38 )		538	577
Posey	(Aggregate	196	196	)	1214	1410
Putnam	10			477	2005	2492
Randolph	(Aggregate				951)	951
Ripley	1	1	80	39	1129	1250
Rush	2		126	106	2347	2581
Scott	(Aggregate	108		)	601	709
Shelby			108	139	1723	1970
Spencer*					621	
St. Joseph				200	813	1013
Sullivan	1		74	80	994	1149
Switzerland					1270	
Tippecanoe	2	1	155	165	1725	2048
Union*					1268	
Vanderburgh	2	4	24	41	641	712
Vermillion	3	4	77	205	1293	1537
Vigo*					1418	
Wabash			4	572	147	723
Warren				76	840	916
Warrick	2		27	75	699	803
Washington	(Aggregate	196		)	2042	2238
Wayne	(Aggregate	788		)	3386	4174
White			18	3	168	189

INDIANA, TO WIT:

This certifies that the foregoing is a correct statement of the returns made to me.

WM. SHEETS,  
Secretary of State.

\* No return from the Clerk.

† Of this number 230 are in the unorganized county of Porter.

‡ Of this number 50 are in the county of Kosciusko.



# H. R.

## REPORT.

OF THE

## SINKING FUND.

DECEMBER 30, 1835.

Read and referred to Committee of State Bank, and ordered that 1,200 copies be printed.

The Board of Commissioners of the Sinking Fund submit the following Report of Receipts and Expenditures from the period of their organization to Dec. 30, 1835.

Premium of loan negotiated in August, 1834, deducting interest for instalments paid in advance	\$4,846 92
Premium of loan negotiated in August 1835	20,250 00
Amount of loan not required to pay the instalments of individual stockholders	135,173 13
Dividend on state stock, Nov. 1835	15,000 00
Interest on loans	5,757 40

\$181,027 45

From which must be deducted

Interest due January 1, 1835	\$7,457 10
" " July 1, "	12,739 78
" " January 1, 1836	19,458 34

Total

\$39,655 22

Allowances to Canal Fund Commissioners, for pay and expenses in 1834, and Mr. Sullivan's in 1835	2,149 37½
Expense of transporting Specie	647 69½
Current expenses, including Books, Stationary, pay of Commissioners, Clerks, &c., for taking Mortgages, Printing, &c.	597 95½
Loans made by President of the Board, commencing November 25, and ending Dec. 30, from No. 1 up to No. 200	71,967 50

\$115,017 74½



Leaving a balance of \$66,009 70½ cts. About \$30,000 of this sum, however, has been loaned by two of the commissioners, it is understood, but the mortgages have not yet been returned to the office. The balance of the fund is now being loaned, and will probably be taken by the applications on hand. The interest to be paid on these loans is eight per cent. per annum, each year in advance, and they are secured by real property valued at double the amount loaned, exclusive of perishable improvements.

By order of the Board,  
Office of Sinking Fund, }  
Dec. 30, 1835, }

S. MERRILL, *Pres't*

# REPORT

OF THE

## AGENT OF STATE FOR THE TOWN OF INDIANAPOLIS.

DECEMBER 30, 1835.

Read and referred to the Committee on affairs of the town of Indianapolis.

Hon. CALEB B. SMITH,  
*Speaker of the House of Representatives:*  
 AGENT'S OFFICE,  
*Indianapolis, Dec. 29, 1835.* }

SIR—

Please lay before the body over which you preside the accompanying Report.

Very respectfully, your obed't serv't,  
 JNO. G. BROWN, *Agent.*

AGENT'S OFFICE, *Indianapolis, Dec. 1, 1835.*

It appears from the books in this office, that since the last annual report of the Agent of State for the town of Indianapolis, there has been received, up to the first of August last, by my predecessor, the sum of

From 1st August to 1st December inst. by incumbent	\$11,508 60
	592 80

Total amount received during the year	\$12,101 40
---------------------------------------	-------------

There will become due to the State on account of sales of lots in 1835	\$463
" 1836	1,045
" 1837	651 25
" 1838	16 25

Making the total amount yet accruing to the State	\$2,176 74
---------------------------------------------------	------------

There yet remains unsold and unappropriated out-lot No. 147, containing 27 4.100 acres.

All of block No. 48, except lot No. 2.  
 Lots No. 7 and 8 in square 46.  
 Lot No. 10 in square 54.

From the above exhibit it will be seen that the future operations of the State in reference to the Indianapolis Donation will be so limited, that the propriety of the discontinuance of the Agency, as a distinct office, will readily suggest itself.

All of which is respectfully submitted, JNO. G. BROWN, *Ag't.*

Received of the Treasurer of the State of New York

the sum of \$100.00

for the purchase of land

in the County of New York

for the purpose of

the construction of a

road

between the

towns of

and

in the County of New York

for the purpose of



# REPORTS

16

OF THE SEVERAL BRANCHES

OF THE

STATE BANK.

---

DECEMBER 30, 1835.

Read and referred to the Committee of Ways and Means.

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INDIANAPOLIS:

DOUGLALS & NOEL, PRINTERS.

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1836.

STATE of the Branch at Indianapolis of the State Bank of Indiana, at 2 o'clock, P. M., on Saturday, 21st Nov., 1835.

Dr. Cr.

Notes and Bills discounted	155,510 96	Capital stock paid	120,000 00
do purchased	28,092 01	Notes of the Branch in circulation	135,745 00
State Bank of Indiana		Br. of the State Bank at Richmond	3,245 31
Branch at Lawrenceburgh	84,418 28	New Albany	52 73
Madison	61,245 61	Evansville	3,361 74
Lafayette	7,232 98	Vincennes	279 67
		Terre-Haute	490 95
Deposit in Commercial Bank, Cin'ti	6,970 77		7,630 40
Franklin Bank do	5,017 98	Ohio Life Ins. & Trust Company	650 00
Bank of Kentucky	374 84	Treasurer of the U. States	693,758 33
City Bank, N. York	196,652 64	Samuel Merrill, Pens. Agent	10,002 53
		Samuel Merrill, Pres't State Bank	7,127 75
Drafts on N. York payable on sight		Dividend No. 1	700 00
Drafts on Philadelphia "		Surplus fund	4,952 65
Remittance to New York		Permanent fund	200 00
Commissioners of the Canal Fund		Commissioners Sinking fund	1,598 00
Expenses, viz: Furniture & Vault	917 34	Individual depositors	107,298 73
Protest	2 00	Discount	1181 83
		Premium	213 65
Cash, viz: Notes of other branches			1395 48
of the State Bank	59,355 00		
Other State Banks	109,513 00		
United States Bank	130,070 00		
	298,938 00		
			1,091,058 87

Specie, viz: Gold 3,724 60  
 Silver 103,022 12  
 Cents 6 00

---

106,752 72

---

1,091,058 87

Officers and their compensation—

Hervey Bates, Prest. and acting as Teller,  
 per annum

700 00

B. F. Morris, Cashier, per annum

1,000 00

Rent paid

125 00

B. F. MORRIS, *Cashier.*



*To the Senate and House of Representatives of the State of Indiana :*

In obedience to a requisition in the charter, I forward to you herewith, on behalf and by direction of the President and Directors of the Branch at Richmond of the State Bank of Indiana, a statement of the condition of this Branch Bank, on seventh day, at 2 o'clock, P. M., 11th month 21st, 1835: together with the names of the officers, and the compensation to each, no rent being paid by this branch.

All of which is respectfully submitted.

ELIJAH COFFIN, *Cashier.*

*Richmond, 11th Month 21, 1835.*

STATEMENT of the condition of the Branch at Richmond of the State Bank of Indiana, at 2 o'clock on 7th day, 11th month 21, 1835.

**Dr.**

Bills discounted on personal security	\$198,969 69	
Domestic bills of exchange	2,000 00	
	<hr/>	\$200,969 69
Banking house		2,877 52
Furniture and fixtures		168 87
Current expense		11 25
Interest		1 10
Branch Bank at Indianapolis	\$4,545 32	
do do Lafayette	600 00	
	<hr/>	5,145 32
Deposite subject to our draft in Philadelphia	15,110 30	
do do New York	89,687 31	
do do Cincinnati	62,711 88	
Due us from sundry Ohio banks	17,245 00	
Remittances to N. York not yet acknowledg'd	13,750 00	
	<hr/>	
Total claims on other banks		198,504 49
Cash on hand, viz:		
Bank notes, other branches this State	\$32,500	
Other State Banks	49,640	
United States do	41,060	
	<hr/>	
Amount paper		\$123,200
Specie: Amer. Silver and copper	\$47,160 00	
Foreign Silver	47,586 72	
American Gold	3,879 67	
Foreign do	485,29	
	<hr/>	
Amount specie		109,111 68

Total cash in specie and notes of other banks and brancees \$232,311 68

\$639,989 92

# STATEMENT of the Branch of the State Bank at Richmond—Continued.

Cr.

Capital stock paid in		\$120,000 00
Discounts received	1,043 45	
Premiums and exchange	79 92	
		<hr/> 1,123 37
Deposit at credit of Treasurer U. States		287,400 00
do do Pension Agent of Indiana		1,453 49
Due to individual depositors		22,352 37
Due to Branch Bank at Madison	374 10	
do do Terre-Haute	243 17	
		<hr/> 617 18
Deposit at credit of President of State Bank		9,945 00
Permanent fund		200 00
Surplus fund		4,164 15
Commissioner of Sinking Fund		18,984 36
Dividends unpaid—		
On State's stock for Sinking Fund	1,500 00	
Individual stockholders' do	700 00	
		<hr/> 2,200 00
Notes of this Branch in circulation		171,050 00
		<hr/> <hr/> \$639,989 92

## The officers in this Branch are

Achilles Williams, President; salary per annum	\$350
Elijah Coffin, Cashier;                   "                   "	1,000
Noah Leeds, Clerk;                         "                   "	500

ELIJAH COFFIN, *Cashier.*

# STATE of the Branch at Lawrenceburgh of the State Bank of Indiana, on 21st November, 1835.

Dr.

Cr.

Bills discounted	57,649 48	Capital stock paid in	120,000 00
Domestic Bills of exchange	125,841 71	Discount	1,059 77
		Exchange	522 46
Other real Estate			
Furniture and fixtures		U. S. Pension Agent in Indiana	1,582 23
Current expense		Postage	421 26
Dues from other Brs. and Banks			1 00
Branch at Madison	1,473 89	Dues to other Branches and Banks—	
Commercial Bank of Cincinnati	22,671 84	Branch at Indianapolis	74,417 03
Franklin do	11,190 50	State Bank of Indiana	3,187 50
Bank of O. Life Ins. & Trust Co.	7,949 37	Lafayette Bank of Cincinnati	45
Urbanna Banking Company	4,000 00	Gerard do Philadelphia	539 71
Bank of Louisville	32,197 80		
do Kentucky	1,140 41	Commissioners of Sinking Fund	78,144 69
Mechanics' Bank of Philadelphia	1,897 55	Surplus do	1,500 00
Merchants' do New York	1,800 00	Permanent do	4,447 73
		Unclaimed dividends	200 00
		Circulation	700 00
Cash, viz: Other State Banks	18,237	Individual deposits	157,850 00
United States Bank	8,085		13,088 79
American Silver			
Foreign do	79,896 77		377,935 70
American Gold			
Foreign do			
		President, Omer Tousey; salary not fixed.	
		Cashier, Enoch D. John	\$1,000
		Principal Book keeper, W. Tho. Chappell,	600
		Rent, per annum,	125
	106,218 77		
	377,935 70		

ENOCH D. JOHN, Cashier.



STATE of the Madison Branch of the State Bank of Indiana on  
Saturday the 21st November, 1835, at 2 o'clock, P. M.

Dr.

Notes discounted	\$144,905 15	
Bills of exchange purchased	115,172 02	
	<hr/>	\$260,077 17
Furniture		223 74
Real property for Banking house at cost		4,396 07
This branch has cash deposited in other banks as follows, viz:		
Franklin Bank of Cincinnati	7,689 11	
Clinton do Columbus, Ohio	232 59	
Bank of Kentucky	4,302 02	
do Ohio Life Ins. and Trust Company	100 00	
Louisville Savings Institution	75 00	
Mechanics' Bank, Philadelphia	1,159 08	
Union Bank of Maryland	4,381 87	
Merchants' Bank of New York	6,728 52	
Merchants' and Mechanics' B'k., Wheeling	716 62	
Commercial Bank of Cincinnati	8,493 44	
Bank of Louisville	73 48	
Lafayette branch of the State Bank	257 29	
Richmond do do	361 51	
Commissioners of the Sinking Fund	18 50	
	<hr/>	34,589 03
Cash on hand, viz:		
Other Branches of the State Bank	250 00	
Other bank notes and checks at par value	3,022 50	
Notes on Banks in Louisville	13,795 00	
do do Cincinnati	15,290 00	
United States Bank notes	45,500 00	
Gold	2,064 37	
Silver	80,827 88	
	<hr/>	160,749 75
		<hr/>
		\$460,035 76
Salaries: J. F. D. Lanier, President,		\$800 00
Jno. Sering, Cashier,		1,200 00
Rent paid, per annum		125 00

STATE of the Madison Branch of the State Bank—Continued.  
Cr.

Capital stock paid in	120,000 00	
Transfer of capital from branch at Bedford	20,000 00	
		140,000 00
Branch notes in circulation		195,255 00
Profit and loss since 31st Oct. 1835		2,547 93
Surplus fund		6,450 00
Commissioners of Sinking Fund		1,500 00
Permanent fund		200 00
Individual stockholder's dividend not paid out		700 00
Samuel Merrill, President of State Bank		3,281 25
Individual depositors		52,354 25
Other branches have deposited in this branch as follows, viz:		
Terre-Haute Branch of the State Bank	239 82	
Vincennes do do	20 00	
Bedford do do	676 33	
Lawrenceburgh do	1,473 89	
Indianapolis do do	48,516 93	
Bank of Va. at Charleston Ra.	234 43	
Commercial Bank of Scioto	2,849 56	
Bank of Chillicothe	291 81	
do Pittsburgh	387 47	
Merchants' & Manufact'rs' B'k., Pittsburgh	3,057 09	
		57,747 33
		<u>\$460,035 76</u>

OFFICE STATE BANK IA., AT MADISON, }  
November 21, 1835. }

The foregoing shews fully the state of said Branch on said day. This Branch owns no other real estate than that named, which, at this time is worth an advance of 20 per cent. on cost. We have neither note nor bill under protest, nor one debt considered in the least doubtful.

JOHN SERING,  
Cashier.





EVANSVILLE BRANCH BANK, }  
30th November, 1835. }

*To the Hon. the Speaker of the H. of Representatives of the State of Indiana :*

SIR—I now beg leave to transmit to you enclosed, the annual Report of the Board of Directors of this Branch of the State Bank of Indiana, as required by the charter: Also the weekly report of the state of the Bank on the 21st of this month, both of which documents you will be pleased to lay before the House at the proper time and season.

I have the honor to be, Sir, your most ob't serv't,

JOHN DOUGLASS, *Cashier.*

*REPORT of the Board of Directors of the Evansville Branch of the State Bank of Indiana.*

The Board of Directors of the Evansville Branch of the State Bank of Indiana, in compliance with the requisition contained in the 11th article of the 15th section of the charter incorporating the said Bank, do now report to the House of Representatives of Indiana, in regard to the various items demanded by the said section of the charter, as the same are found on the third Saturday, being the 21st day of Nov., 1835, at 2 o'clock in the afternoon; and the Directors for the further information of the House herewith transmit a copy of the Cashier's weekly report, exhibiting a complete statement of the condition of the Evansville Branch on the aforesaid day, month, year, and hour.

1st. The amount of available funds on hand and the particulars thereof, are as follows:

Paper of other Branches of the State Bank	\$2,555 00
do Other State Banks	2,750 00
do Of the U. S. Bank and Eastern checks	14,110 00
Gold	1,011 37
Silver	49,258 56
Cents	20 00

Total amount of funds on hand \$69,704 93

2d. The amount of notes discounted is 153,874 27

3d. The amount of bills of exchange is 12,053 94

4th. The surplus fund was credited with the amount of the profit arising on the business done during the first five months of the operations of the bank, ending 30th April, 1835, \$479 15

And it has been credited with the balance of profit and loss account for the six months ending 31st October, 1835, after declaring a dividend for these six months, of 3 per cent. on the capital stock paid in

1,578 78

Total amount now at credit of the surplus fund \$2,057 93

- 5th. The amount of notes in circulation is \$126,885 00  
 6th. The only officer in the Bank who receives a compensation is the Cashier, whose salary is \$1,200 per annum.  
 7th. The amount of rent paid for the bank office is \$150 per annum.  
 8th. The Directors have recently bought a lot in Main street, for the purpose of building a banking house upon it, for which they have paid one thousand dollars, but have not as yet commenced building.  
 9th. This branch owns no real estate except the foregoing lot.  
 10th. The Evansville Branch is not, at present indebted to any other bank; and the respective amounts due to it by other banks are as follows:

By the Branches of the State Bank of Indiana, viz:

Indianapolis Branch	\$3,361 74	
New Albany do	650 00	
Vincennes	2,228 25	
Terre-Haute	2,117 62	
		<hr/>
		8,357 61

By other Banks, viz:

Bank of Louisville	10,071 75	
Commercial Bank of Cincinnati	3,275 25	
N. Orleans Canal & Banking Co.	2,000 00	
Commercial Bank of Pennsylvania	7,279 23	
Merchants' Bank, New York	31,129 22	
		<hr/>
		53,755 45

Total amount due to the Evansville Branch by other Branches and Banks		<hr/>	\$62,113 06
-----------------------------------------------------------------------	--	-------	-------------

In conclusion the Directors would beg leave to remark that the business of the Evansville Branch, during the past five months of its operations, was very limited, and the profit exhibited for that period is consequently small. Since then, however, the business has been, and still is gradually on the increase; and there is every reason to believe that it is now, and will continue to be as safe and as profitable as that of most of the other branches of the State Bank.

The geographical position of Evansville has made it the great outlet and inlet for the whole North-western section of Indiana, and it has now every appearance, as well as the fairest prospects of soon becoming a place of considerable magnitude. The banking business must increase with the increase of the town, and there can be no doubt that in a few years a very considerable augmentation of banking capital will be required to meet the demands of the community and of the surrounding country.

All which is respectfully submitted, by order of the Board of Directors.

JOHN MITCHELL, *President.*

JOHN DOUGLASS, *Cashier.*

Evansville, Branch Bank, 30th Nov. 1835.

**STATE of the Branch at Evansville of the State Bank of Indiana, on  
21st November, 1835.**

Dr.

Bills discounted	\$153,874 27	
Bills of exchange	12,053 94	165,928 21
Branch of State Bank at Indianapolis	3,361 74	
New Albany	650 00	
Vincennes	2,228 25	
Terre-Haute	2,117 62	8,357 61
Bank of Louisville	10,071 75	
Commercial Bank of Cincinnati	3,275 25	
New Orleans Canal Banking Company	2,000 00	
Commercial Bank of Pennsylvania	7,279 23	
Merchants' Bank, New York	31,129 22	53,755 45
Vault	542 18	
Banking house lot	1,000 00	
Furniture	323 21	1,867 39
Cash, viz: Other Branches of State Bank of Ia.	2,555 00	
Other State Banks	2,750 00	
United States Bank	14,110 00	
Gold	1,011 37	
Silver	49,258 56	
Cents	20 00	69,704 93
		<u>\$299,613 59</u>

## Notes of Branches on hand:

Indianapolis	200	Vincennes	585
Lawrenceburgh	65	Bedford	470
Richmond	155	Terre-Haute	440
Madison	155	Lafayette	350
New Albany	135		



# STATE of the Evansville Branch of the State Bank—Continued. Cr.

Capital stock		\$120,000 00
Notes of the Branch in circulation		126,885 00
S. Merrill, Pension Agent		517 43
President of the State Bank of Indiana		12,968 75
Unclaimed dividends	700 00	
Permanent fund	200 00	
Surplus fund	2,057 93	
Commissioners of Sinking Fund	1,500 00	
		<hr/>
		4,457 93
Premium	289 67	
Discounts received	514 57	
		<hr/>
		804 24
Deposite for third instalment of stock	78 13	
Individual depositors	33,902 11	
		<hr/>
		33,980 24
		<hr/>
		\$299,613 59

## Officers and their compensation—

President, John Mitchell, no compensation.

Cashier, John Douglass,

Rent paid

1,200

150

JOHN DOUGLASS, *Cashier.*

*Evansville, 30th Nov., 1835.*

STATE of the Branch at Bedford of the State Bank of Indiana, on  
November 21, 1835.

Dr.

Bills discounted	119,712 26	
Bills of exchange	17,200 00	
		<u>136,912 26</u>
Branch of State Bank at Madison		419 18
Bank of Louisville		10,000 00
Rimittance to Indianapolis, (defaced note),		5 00
Expenses		<u>436 94</u>
Banking house	1,076 57	
Furniture	59 25	
		<u>1,135 82</u>
Cash, viz: Other Branches of State Bank of Ia.	765 00	
Other State Banks	750 00	
United States Bank	4,060 00	
Draft on New York	15,000 00	
Gold	6,218 57	
Silver	76,682 83	
Cents	13 00	
		<u>103,489 40</u>
		<u>252,398 60</u>
Expenses		<u>436 94</u>
Profit		<u>367 11</u>
		<u>804 05</u>
Notes of Branches on hand: Lawrenceburgh		40
Madison		435
New Albany		290

STATE of the Branch of the State Bank at Bedford—Con-  
tinued. Cr.

Capital stock		\$100,000 00
Notes of Branch in circulation		131,525 00
Branch of State Bank at Lafayette		125 00
S. Merrill, President of State Bank of Indiana	5,218 75	
do Pension Agent	1,598 16	
		<u>6,816 91</u>
Protest		4 00
Unclaimed dividends		700 00
Permanent fund	200 00	
Surplus fund	2,314 72	
Commissioners of Sinking Fund	1,508 25	
		<u>4,022 97</u>
Discount	740 75	
Exchange	63 30	
		<u>804 05</u>
Individual depositors		8,400 67
		<u>252,398 60</u>
Result of the business of the branch since last dividend—		
Discount		740 75
Premium		63 30
		<u>804 05</u>
Officers and their compensation: President, Wm. McLane		200 00
Cashier, D. R. Dunihue		600 00
Clerk, John Brown		400 00
Rent paid		65 00
D. R. DUNIHUE, Cashier.		



STATE of the Branch at Vincennes of the State Bank of Indiana, on  
Saturday at 2 o'clock, P. M., 21st November, 1835.

Dr.

Bills discounted	149,615 76	
Bills of exchange	1,785 00	
		151,400 76
Branch of State Bank at Indianapolis	279 68	
Madison	20 00	
Terre-Haute	6,680 00	
Lafayette	104 48	
Merchants' Bank, New York	21,400 00	
Commercial do Cincinnati	1,263 86	
		29,748 02
Expenses		8 44
Furniture		528 07
Cash, viz: Other branches of State Bank of Ia.	10,280 00	
Other State Banks	12,185 00	
United States Bank	39,830 00	
Gold	6,063 35	
Silver	64,627 57	
Cents	1 24	
		132,987 16
		<u>\$314,672 45</u>
Notes of Branches on hand: Indianapolis		4,200
Lawrenceburgh		140
Richmond		115
Madison		160
New Albany		135
Evansville		2,055
Bedford		1,125
Terre-Haute		155
Lafayette		2,195

**STATE of the Branch at Vincennes of the State Bank of Indiana—  
Continued.**

**Cr.**

Capital stock		\$120,000 00
Notes of the Branch in circulation		161,480 00
Branch of State Bank at Evansville	935 00	
Bank of Louisville	226 05	
	<hr/>	1,161 05
S. Merrill, Pension Agent	1,215 21	
President of the State Bank	8,843 75	
	<hr/>	10,058 96
Unclaimed dividends		700 00
Permanent fund		200 00
Surplus fund		1,718 46
Commissioners of Sinking Fund		1,500 00
Discount	525 98	
Premium	52 85	
	<hr/>	578 83
Individual depositors		17,275 15
		<hr/>
		\$314,672 45
		<hr/>
Officers and their compensation—		
President, D. S. Bonner		
Cashier, John Ross		1,000 00
Clerk, G. W. Rathbone		400 00
Rent paid per annum		150 00

BRANCH BANK AT VINCENNES, }  
Saturday, Nov. 21, 1835. }

The Directors of this Branch make the above report agreeably to the 65th section of the charter, and submit the same to the legislature, as a correct statement of the condition of this Branch, as found at the above date at 2 o'clock, P. M.

D. S. BONNER, *President.*

JOHN ROSS, *Cashier.*

## STATE BANK OF INDIANA, BRANCH AT TERRE-HAUTE, }

November 26, 1835. }

SIR—I herewith transmit a report showing the state of this Branch, on Saturday, Nov. 21st. at 2 o'clock, P. M., as required by the 65th section of the charter.

I have the honor to be, Sir, your most ob't serv't,

A. B. FONTAINE, *Cashier.*

*Hon. Speaker of the H. of Rep.*

STATE of the Branch at Terre-Haute of the State Bank of Indiana, on Saturday, November 21, 1835, at 2 o'clock, P. M.

**Dr.**

Bills discounted	156,395 92	
Bills of exchange	6,000 00	
		162,395 92
Due from other Banks, viz:—		
Branch at Indianapolis	540 95	
do Madison	239 82	
do Lafayette	555 13	
do Richmond	243 17	
Bank of Louisville	42,867 59	
Commercial Bank of Cincinnati	2,625 42	
Office Bank U. S. at New Orleans	1,450 00	
New York Dry Dock Company	50,164 75	
		98,686 83
Real estate, being lot for Banking house		1,000 00
Furniture on hand, value at this time		628 06
Expenses, current		2 44
Protest account		1 75
Cash on hand as follows:		
Notes of, and checks on other Branches	7,211 67	
do do U. S. Bank and Brs.	7,145 52	
do do Other State Banks	11,713 98	
Gold	597 08	
Silver	49,648 90	
		76,317 15
		<u>\$339,032 15</u>
Officers and compensation:—		
President, per annum	400 00	
Cashier           “	1,000 00	
Clerk             “	400 00	
Porter            “	182 50	
Rent paid        “	150 00	



STATE of the Branch of the State Bank at Terre-Haute—Con-  
tinued. Cr.

Capital stock paid in		\$119,920 87
Notes of this Branch in circulation		169,970 00
Due to other Branches, viz:—		
Branch at Evansville	102 62	
do Vincennes	6,680 00	
Tradesman's Bank, New York	243 17	
Clinton Bank of Columbus, Ohio	265 05	
		<hr/> 7,290 84
Permanent fund, State tax		200 00
Surplus fund		2,667 38
Commissioners of Sinking Fund		1,507 00
Unclaimed dividends		700 00
Individual depositors		35,574 18
Profits since last dividend, viz:		
Discounts	855 72	
Premiums	346 16	
		<hr/> 1,201 88
		<hr/> <hr/> \$339,032 15

By order of the Board,

D. DEMING, *President.*

A. B. FONTAINE, *Cashier.*

In pursuance of the 11th section of the charter of the State Bank of Indiana, the undersigned Directors of the Branch of said Bank at Lafayette, make the following report of the condition of said Branch on the 3d Saturday in November, 1835, at 2 o'clock, P. M.

Dr.

Bills discounted		130,842 02
Bills of exchange		52,823 49
Merchants' Bank, city of New York	29,955 76	
Louisiana State Bank, New Orleans	1,269 00	
Leather Manufacturers Company, New York	1,350 00	
Branch U. S. Bank, Washington City	1,600 00	
Canal Fund Commissioners of Indiana	45,705 00	
Branch Bank at Bedford	125 00	
	<hr/>	80,004 76
Current expenses	134 60	
Banking house lot	600 00	
Furniture and Vault	205 40	
Protest account	21 50	
	<hr/>	961 50
Cash on hand: Other State Banks	16,145 00	
United States Bank	2,370 00	
Drafts received as cash and certificates depos'td	3,720 00	
Gold	697 10	
Silver	87,969 00	
	<hr/>	110,904 43
		<hr/>
		\$375,533 20
		<hr/>
Branch Notes not yet filled up		55,500 00

STATE of the Branch at Lafayette of the State Bank of Indiana—  
Continued.

Cr.

Capital stock	119,857 78	
Notes of Branch in circulation	164,495 00	
Bank at Lawrenceburgh	100 42	
Madison	146 17	
Terre-Haute	255 13	
Vincennes	504 48	
Indianapolis	7,316 34	
		8,222 54
Commercial Bank, Cincinnati	475 83	
Louisville Savings Institution	200 00	
Samuel Merrill, Pension Agent	732 39	
Commissioners Wabash and Erie Canal	1,911 64	
Samuel Merrill, President of State Bank	2,203 38	
		5,523 24
Unclaimed dividends	700 00	
Permanent fund	200 00	
Surplus fund	4,923 56	
Sinking fund	1,500 00	
		7,323 56
Individual depositors		68,807 05
Discount	1,664 42	
Premium	207 38	
Interest	2 23	
		1,274 03
		<u>\$375,533 20</u>
Officers, viz: President		
Cashier		900 00
Clerk		400 00
Rent paid		150 00
Thos. T. Benbridge, <i>President,</i>	George Nichol,	
Jno. D. Farmer,	David Runnion,	
Andrew Ingram,	R. S. Ford,	
John M'Cormick,	William P. Heath.	
John Taylor,		











17  
H. R.

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## AUDITOR'S REPORT.

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DECEMBER 30, 1835.

Read and referred to the Committee of Ways and Means, and 1,200 copies ordered to be printed.

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AUDITOR'S OFFICE,  
Indianapolis, Dec. 28, 1835. }

Hon. C. B. Smith,

*Speaker of the House of Representatives:*

SIR—

Herewith you will receive my report under the Ad Valorem Act of last session; it will be seen that several counties have not been heard from, though all the delinquents have been *requested* to comply with the requisitions of the law, some weeks since. As soon as their returns are received they will be laid before the House.

It is a matter of regret that the returns of the Clerks, exhibit too palpably, a want of proper attention on the part of the County Boards in the appointment of Assessors. One of the clerks certified that it is impossible to make any statement from the assessor's returns, owing to blots and bad writing, and yet this return was received by his County Board.

Some of the assessors valued the lands with *all* improvements, and some excluded them. In almost every instance the assessor gave in his property at his own valuation. In this way, persons gave a fair value to their property, but the greater portion valued it fifty per cent. below its selling price. To remedy this, it is recommended to appoint, in each county, three Commissioners of valuation, (who shall be sworn to a faithful discharge of their duties) to accompany the Assessor, and value all property previous to assessment. Allow this valuation to suffice for four or five years—for it is apprehended, more will be lost by imperfect assessments each year, than gained by the annual increase of the value of property.

The present law exempts all Canal, Seminary, and Saline lands sold on a credit, on which final payment has not been made, from taxation.

Many of these lands, particularly the canal lands, have been bought at low prices, and are now greatly enhanced in value by the State expenditures in the construction of the canal. Unless these lands be made liable to taxation, their owners will not pay a cent of tax for a period of ten or twelve years.

Very respectfully, Sir,

Your obed't serv't,

M. MORRIS,  
A. P. A.

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Many of these lands, particularly the canal lands, have been bought at low prices, and are now greatly enhanced in value by the State expenditures in the construction of the canal. Unless these lands be made liable to taxation, their owners will not pay a cent of tax for a period of ten or twelve years.

Very respectfully, Sir,

Your obed't serv't,

M. MORRIS,

A. P. A.

A TABLE shewing Assessments under the "Act to provide for an equitable mode of Levying the Taxes of this State," approved February 7, 1835.

COUNTIES.	No. Acres of Land.	Value of Lands including Buildings.	Value of Town Lots and Buildings.	HORSES AND MULES.		CATTLE.		HOGS.		Value of Merchants' Capital.	Value of Brokers' Capital.	Value of Corporation Stock.	Amount of Money at Interest.	Value of Low Libraries.	Value of Medical Libraries.	Aggregate value of all other taxable property not specified.	POLLS.		Total amount of Taxables.
				No.	Value.	No.	Value.	No.	Value.								No.	Value.	
Allen	19,097	\$ 110,553	\$ 108,750		\$ 23,915		\$ 12,491		\$ 2,276	\$ 26,500		\$ 730	\$ 2,999	\$ 900	\$ 180	\$ 18,902			
Bartholomew	55,416	144,969	1,936	1,387	46,360	1,262	12,150	12,787	21,583	6,068		187	25,132		205	22,303	1,049	395	\$ 551,413
Beech	17,813	100,710	6,940	913	32,676	550	5,982	3,392	4,903	13,581		435	4,324	50	117	14,354	717	268	184,072
Clarke	718,913	803,737	106,028	2,355	86,678	2,291	20,325	8,654	13,207	42,660		150	56,896	600	670	54,939	1,355	508	1,388,129
Clay	12,935	57,485	5,000	539	21,521	556	5,518	4,685	7,407	9,130		557	1,705			7,153	471	214	106,399
Crawford	31,522																500	187	201,041
Crawford	36,266	279,003	22,459	999	38,755	1,090	14,049	4,002	7,558	19,410		1,035	9,469	130	118	22,822	703	263	415,073
Cass	36,168	146,598	149,613	700	29,716	1,174	16,998	2,005	10,108	40,300			8,824	750	235	48,613	695	250	491,108
Clinton	50,138	301,292	13,103	1,121	42,223	897	9,611	3,328	5,674	11,715		5,600	5,458		182	22,267	725	271	320,025
Dearborn	196,451	1,731,927	246,620	3,064	11,763	3,466	41,375	6,938	12,933	151,243		95,447	108,833	15	355	73,689	2,397	898	2,561,375
Decatur	60,231	779,111	76,399							36,100			15,089			62,075			
Davies	65,195	219,293	30,247	1,472	52,870	1,565	11,448	7,151	9,502	23,861		1,858	4,435	555	291	27,195	776	291	111,848
Delaware	17,461	112,131	6,707	919	31,139	1,033	9,723	2,297	4,096	12,875			2,478	275	205	13,694	635	238	193,221
Elkhart	5,116	19,513	2,445	1,062	44,868	1,651	25,689	2,186	5,355	25,900			8,301	300	248	28,323	838	313	161,287
Dubois																			
Fayette	192,751	1,325,589	61,873	2,586	103,145	1,640	16,921	14,044	39,414	28,100		1,762	30,108	902	291	63,751	1,287	482	1,672,339
Floyd																			
Franklin	137,009	1,092,613	42,493	2,673	105,677	2,195	23,728	10,846	24,572	53,241		2,500	47,711	606	1,075	79,547	1,506	363	1,881,663
Franklin	130,119	770,464	32,000	2,320	96,322	2,442	25,687	8,708	14,069	57,201		2,250	8,722	557	568	38,838	1,256	471	1,016,018
Gibson	84,001	325,697	33,739	1,930	82,990	1,740	13,730	11,339	17,256	46,329		3,603	36,378	554	485	42,911	929	385	605,013
Greene	44,196	142,261	15,004							16,334		250	4,889			108,041	501	300	287,082
Grant	9,030	92,301	6,014	312	3,809	560	3,690	1,201	3,596	6,171			292			7,676	349	130	125,652
Hamilton	33,296	240,361	14,274	1,024	36,443	794	9,079	7,874	6,413	18,317		500	10,683		246	17,569	680	255	351,140
Harrison	163,325	651,287	43,783	2,455	86,618	2,382	19,572	7,574	11,237	33,332		4,500	12,484	350	355	46,700	1,549	380	910,799
Hendricks	45,500	310,355	18,776	1,273	43,932	853	525	5,928	10,060	29,205		500	11,218	104	167	27,816	1,002	375	451,886
Henry	108,006	837,187	45,476	2,197	80,044	1,391	15,370	8,156	14,569	46,351		187	27,726	185	350	45,303	1,610	607	1,115,357
Hancock	26,095	174,722	19,167	974	34,217	517	5,787	3,777	5,999	9,500		1,350	1,837	300	100	29,871	750	281	287,131
Huntington	880	4,400	16,654	55	2,965	188	3,176	56	167	6,950							217	92	29,104
Jackson	80,198	416,373	33,092	1,464	42,204	1,865	17,197	13,444	22,684	30,667		850	11,689	350	145	26,266	968	363	591,614
Jefferson	148,721	1,110,786	714,467							204,754		93,230	3,354,430			65,338	1,793	672	5,751,738
Jennings	53,199	273,156	25,039	1,122	36,590	1,211	11,869	6,837	10,961	14,142			17,535	90	150	16,103	910	352	406,637
Johnson	74,011	303,063	13,053	1,586	52,672	1,041	9,169	10,487	15,205	24,447			9,951	115	990	29,875	1,103	413	461,954
Knox	153,998	529,637	193,775	2,164	84,119	2,366	21,239	9,720	12,556	63,700			17,329	1,200	240	62,619	1,164	436	991,530
Lawrence	127,720	373,761	36,250	1,989	72,245	2,235	18,669	13,341	19,234	24,050		23,637	25,929	200	245	50,785	1,498	561	816,663
Lagrader																			
Laporte	64,550	312,420	175,025	1,232	50,323	2,259	36,371	2,001	5,049	82,890			8,836	195	220	37,333	1,232	462	708,581
Madison	26,207	393,860	11,847	1,063	37,020	960	10,400	4,663	7,914	11,040			5,885	136	649	19,627	830	311	304,171
Marion	151,875	948,143	329,948	2,737	96,838	2,199	20,142	9,776	16,594	112,325		30,000	11,118	2,200	297	195,846	1,784	669	1,370,121
Martin	20,124	61,303	5,930	465	15,433	568	4,052	3,227	4,395	11,150		187	9,570		40	4,399	318	130	116,587
Monroe	82,086	406,714	44,380	1,781	65,865	1,820	15,863	13,489	22,776	37,900			17,911	375	967	34,093	1,213	451	666,436
Montgomery	102,826	721,147	59,981	2,902	110,620	2,350	23,662	13,407	19,380	64,425	195	997	33,333	200	692	65,819	1,699	637	959,569
Morgan	69,606	331,321	19,965	1,553	57,096	1,442	16,918	12,516	20,873	35,275		2,250	20,780	139	111	28,040	1,144	429	535,669
Miami																			
Orange	80,750	333,565	39,396	1,744	66,311	1,753	14,346	10,698	13,417	29,185			23,923	400	525	39,371	978	364	554,069
Owen	54,004	216,490	14,647	1,143	40,939	1,093	9,692	11,111	18,604	30,184	27	790	6,215	292	318	20,584	818	318	359,504
Parke	17,771	765,357	56,135	2,305	87,237	2,045	20,979	15,107	20,890	72,842		1,377	49,361	1,230	350	50,959	1,511	566	1,127,411
Perry	29,555	193,725	18,370	747	27,357	879	8,001	3,692	6,150	13,494			8,347	260	40	8,644	548	205	281,479
Pike	32,112	114,690	6,970	609	25,021	553	4,215	5,069	7,645	7,710		325	2,225		40	9,750	515	204	175,867
Poscy																			
Putnam	99,115	620,656	34,252	2,655	85,087	2,684	21,847	16,748	24,981	57,184		5,182	33,215	290	3,901	45,923	1,471	551	844,966
Randolph	51,691	211,739	6,433	1,463	49,509	970	10,207	4,254	6,856	5,689		682	4,021	160	82	16,061	948	355	314,440
Ripley	85,908	361,332	24,385	1,462	51,564	1,491	15,165	5,110	10,500	22,050			14,916	375	307	27,553	988	370	529,375
Rush	185,872	1,009,353	33,377	3,813	146,533	2,284	21,232	20,604	38,669	48,735		1,573	40,554	388	1,478	80,504	2,478	816	1,423,566
Scott	32,713	139,411	16,783	857	31,281	724	6,635	3,654	6,148	7,250			5,304		125	18,387	556	208	281,799
Shelby	103,592	716,062	29,247	2,237	61,058	1,332	12,275	11,262	19,103	33,411			16,300	358	569	37,920	1,471	551	844,966
Spencer																			
Sullivan	75,335	298,768	21,540	2,000	60,479	2,091	13,590	9,187	9,807	26,531		3,354	5,132	135	320	29,680	894	335	469,300
Switzerland	99,510	799,871	78,263	1,661	62,043	1,411	16,246	4,787	8,664	51,499			33,573	398	384	36,325	1,145	429	1,097,815
St. Joseph	35,284	100,304	13,133	961	43,782	1,657	27,986	2,237	5,497	30,575			13,961	673	228	41,321	832	312	337,772
Tippacanoe	143,910	867,617	159,358	2,913	122,975	3,272	47,067	10,074	25,655	104,775			16,514	900	865	61,774	1,942	728	1,428,768
Union	100,578	987,438	20,655																





18

# H. R.

DECEMBER 31, 1835.

Read and referred to the Committee on Claims.

THE HON. C. B. SMITH,  
*Speaker of the House of Representatives:*

EXECUTIVE DEPARTMENT, }  
Indianapolis, 30th Dec. 1835. }

SIR—

I lay before the House of Representatives the particulars, in writing, of the late riots upon the line of the Wabash Canal, which were furnished at my request, by one of the Canal Commissioners. With this history I also submit the claims of the commandants, Captains Murray and Tipton, who at the head of their companies repaired to the scene of disorder in support of the civil authority and liberally advanced money and provisions for the service. It will be seen that the laborers along the line in the adjoining counties, had assembled in preparation for battle, making Wabash county the theatre of their riotous conduct, consequently that county would seem to be chargeable with the expense of the arrests and prosecutions which followed. But as the occurrence was one of an unusual kind, growing out of and threatening the progress of the work in which the state is engaged, it is believed the treasury of that county is not justly chargeable with the expense; and it is recommended that the commissioners appointed to assess damages to private property, or one of the Fund Commissioners be authorized to examine the different claims and direct their payment, so far as would be right, out of the Canal Fund.

Respectfully,

N. NOBLE.

SPEAKER OF THE H. OF R.

INDIANAPOLIS, 30th Dec. 1835.

His Excellency NOAH NOBLE, }  
Governor of Indiana. }

DEAR SIR—

In conformity with your request in relation to the disturbance amongst the Irish laborers on the canal, it is proper to state, that many persons of the two parties into which they are unfortunately divided "Corkonians and Fardowns," who had been engaged in those bloody affrays at Williamsport in Maryland, and at the "high rocks on the Potomac"



within the last two years, had come since September in '34 to the Wabash and Erie Canal, with, as it is said, many of their leaders, and of course brought their animosities with them. And from that time up to the 12th of July last, when the general riot took place, manifested their ill will to each other by merciless beatings on such of each party as chanced to fall in the power of the other. On a considerable portion of the line there was no justice of the peace in these newly organized counties, and as these frays were confined to the Irish almost alone, and to the least worthy, as supposed, amongst them, not much effort was made truly, and perhaps could not well have been made by the civil authority to suppress them. This exasperated course of hostilities continued to increase until it became unsafe for them to travel from one part of the line to the other, without great precautions for their safety, and proceeded to such an extent that they were mutually affraid that each party would have their cabins burnt and their inmates slain in the night; from mutual fears and for safety they had so hired to the contractors that they had about equally divided the line between the parties. The Corkmen working on the upper part, and the Fardowns on the lower end of the line. The beatings of such as were caught from amongst their friends increased to such a degree, and the parties become so exasperated, that about the 1st of July, a determination became general that one or the other should leave the line, and the worthless amongst them by carrying threats of burnings and murder which were to be committed by falling on the defenceless in the night, so excited their fears that they left their houses or cabins, men, women and children, and hid out in the woods without light or fire to betray the places where they were, and the whole line armed in military array, working generally in the day time until some idle report would get in circulation, that the other party was *marching* to fight them, at which times they would leave their work and hasten with great rapidity to the supposed point of danger. From the 4th to the 10th of July these alarms were constant and aggravated by the threats and outrages of the worthless. The length of line occupied by these belligerent parties was nearly fifty miles; and on the 10th of July the parties hastily collected, or rather left their work and commenced a march towards the centre of the line for a general battle.

Two days before this I reached that part of the line, heard there was to be a turn-out, but supposed it only rumor without foundation; several and tried to dissuade them that no such thing would take place. On the 10th, however, one of the Engineers informed that all the workmen on the lower end of the line were armed and marching to the reputed battle field. I met them about half a mile from my residence in very orderly array, well armed, and not a noisy or a drunken man amongst them. They were forced, as they considered, to fight in order to protect themselves and prevent their being slain and their property burned at night; that the civil authority did not, or could not protect them; that their families could not stay in their shantees, had to sleep in the woods, and they had no resource left but a battle; that the weaker party might leave the line; that they wished to work and

remain peaceable, could not, but would rather fight fairly in open day than be subject to these depredations at night. On the assurance that order should be restored and that I would negotiate a suspension of hostilities with the other party, I prevailed on them to wait until I could see their belligerent friends. I then went to the reputed battle field with three or four persons whom I supposed had influence with them, found them fully prepared, well disposed in a strong military position, exceedingly exasperated, and had some difficulty to save those who went with me from being killed. They expressed the same fears of the others, and after some persuasion consented to appoint persons to agree on terms of peace with the Fardowns and suspend hostile operations until the result of the meetings between the persons deputed to negotiate the peace could be known. In the mean time the citizens at Huntington had become exceedingly alarmed at seeing this hostile array of so many men in arms with the avowed intention of meeting in battle with three or four hundred on a side—the civil authority completely controlled, and fearing their persons and property would not be safe, sent to Fort Wayne for aid of the militia. A company immediately was collected and in a few hours sent to their relief; they came to Huntington, the citizens had collected and organized a company also. By this time the citizens of Lagros became alarmed; they sent to Huntington for the troops to come there and protect them and aid the civil authority. So soon as I learned that the militia had turned out from 60 to 100 in number, I thought the force altogether too small to do any good amongst seven or eight hundred armed men: I therefore sent to Logansport and requested their assistance, which was promptly rendered. The militia at Lagros, at my request, marched to Miamiasport and met the two volunteer companies from Logansport, and all marched back to Lagros. Two magistrates and an associate judge were collected, and with the sheriffs of Huntington and Wabash counties, aided by the militia, arrested and committed eight of the ringleaders. Having no jail on the canal line which was considered safe, and for removing also the cause of contention, these men were sent under a strong guard to Indianapolis for safe keeping, where they were confined until liberated by a writ of habeas corpus for some informality in the proceedings.

There were more than 600 armed men of the Irish, and I am satisfied that no other course than the one pursued would have been sufficient to have restored order: by this prompt movement, and bringing in so strong a body of men, in such short time arresting the ringleaders. The commissioning of justices of the peace and organizing militia companies at Wabash, Lagros, and Huntington has restored, and I trust, will preserve order.

The Commissioners, Messrs. Johnson and Lewis, were at Fort Wayne at the time, and I had not the benefit of their advice. So soon as order was restored the Canal Board took more decided steps in their regulations and require each contractor to dismiss any laborer who may engage in a broil and give his name to the engineers that he may not be employed on the line.



The militia turned out on the first moment's warning; many of them happened only to be in town and marched off without any preparation whatever, and had of necessity to be supplied with money and provisions for their subsistence. These were furnished by many of the contractors and people on the line. Amongst those who were at the greatest expense, were Captain E. Murray, of Huntington, who took command of the temporary garrison at Lagros, assisted the civil authority in making the arrests, and with his company marched the prisoners to Indianapolis, and was engaged some three weeks in the service.

Col. John Spencer, of Fort Wayne, who headed the militia from Fort Wayne, and Gen. John Tipton, who was active in forwarding the volunteer companies from Logansport, and paid a large portion of the expenses. One of the prisoners who had been sent to Indianapolis, was arrested on his return to the canal line, convicted and sent to the penitentiary; on his way there he escaped from Mr. Johnson, the sheriff, who offered a reward of \$100, and paid it, as I have understood, for his apprehension. The county of Wabash was also at great expense in sending the prisoners to Indianapolis. Other persons on the line were at much expense, also, in money and provisions, as of course must have occurred in a sudden emergency where the men were called from their homes without the least preparation whatever.

As this expenditure was so absolutely necessary for the preservation of order, and was the means of saving so many human lives, preventing at least 700 armed and highly exasperated men, from fighting a predetermined battle, and the means of preventing a total suspension of work on the canal which must have ensued for the greater part if not all of the season since July. It would be very desirable indeed if some provision, by law, could be made to remunerate those persons who have been at so great expense.

A part of the bills of the money expended are in the possession of the Board of Canal Commissioners, and will be furnished you by 12 o'clock this day. But as they have only a small part, the appointment of some person to hear and examine those claims, and authorize their payment, is respectfully suggested, and the propriety of selecting one of the Board of Fund Commissioners, who from having had no part in these transactions would constitute an impartial tribunal: and as the matter in question grew out of the operations on the canal, and they having the funds in their possession would seem to point out the fitness of such appointments and render it apparent.

With great respect,

D. BURR.

# TREASURER'S REPORT

JANUARY 16, 1836.

Read and referred to the Committee on Education.

TREASURER'S OFFICE,  
Indianapolis, 15th January, 1836. } |

To Hon. CALEB B. SMITH,

*Speaker of the House of Representatives:*

I herewith communicate to be laid before the House of Representatives the accompanying abstract of the Lands and Town Lots, together with the taxes thereon, belonging to non-residents and others, as returned by the collectors of the several counties to the School Commissioners for non-payment of the taxes of 1832-3-4 and 5.

The effects of the law of the last session of the General Assembly relative to these returns, it is found, have produced much more general attention to the subject. The returns of the present year are greatly improved in their general character and uniformity.

It will be seen however, on examination of the abstract, that many counties still fail to make the return required. The counties of Allen, Crawford, Dubois, Elkhart, Floyd, Grant, Huntington, Laporte, Lagrange, Miami, Madison, Perry, Scott, Wabash and White have altogether failed to make any return. In addition to the above, the counties of Clark, Delaware, Harrison, Hamilton, Jennings, Jefferson, Morgan, Orange, Parke, Putnam, Union, Warrick and Wayne have failed to make returns the present year, although the forms were forwarded to the Commissioners in April last.

This matter, both as to the quantity of lands returned, and the amount of tax, as well as the interesting results which may accrue to the cause of education, if the fund be properly managed, is assuming an importance demanding great consideration, and presenting in prospect the most favorable issue.

This fund is rapidly accumulating, and if prudently and systematically managed, cannot fail to produce the most favorable and beneficial results.

It is ascertained that many of the clerks certify the delinquent lists for the collectors, without requiring them to make oath that have made their return to the School Commissioner as required by the law of last session.

This abstract would have been earlier presented to the Legislature but for the delay of the Commissioners in making their returns, many of which have come to hand within a few days.

Respectfully submitted,

N. B. PALMER,  
*Treasurer of State.*



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**ABSTRACT of the Lands and Town Lots, together with the taxes thereon, belonging to non-residents and others, as returned by the Collectors of the several counties to the School Commissioners for the non-payment of the Taxes of 1832-3-4 and 5.**

Counties.	Acres land re- turned in 1832	Acres land re- turned in 1833	Acres land re- turned in 1834	Acres land re- turned in 1835	No. of town lots turned in 1832	No. of town lots turned in 1833	No. of town lots turned in 1834	No. of town lots turned in 1835	Am't of Tax of 1832	Am't of Tax of 1833	Am't of Tax of 1834	Am't of Tax of 1835	Total amount of Tax	Total amount of Tax with 50 per cent	Amount paid in redem- ption.	REMARKS.
Bartholomew	637	2,235	1,916	931	78	103	186		\$4 50	\$43 87	\$40 13	\$35 94	\$114 44	\$171 66	\$ 53 27	No return for 1833 and 1834.
Boone	160			702								8 40	8 40	12 60	7 20	No return for 1832, and no statement of amount of tax for 1833.
Clinton		400	1,632	5,080						15 20	60 96	76 16	114 24	9 56		No return for 1832 and '33.
Carroll			2,440	1,572			30			40 96	26 85	67 81	101 71	10 67		No return for 1832 and '33.
Cass										57 28		57 28	85 92			No return but for amount of tax of 1834.
Clark				4,932						69 14	69 14	103 71				No return for 1832-3 and 4.
Clay			902	991			46			11 77	21 33	33 10	49 65			No return for 1832 and 3, and no redemption.
Delaware										1 20		1 20	1 00			No return but from the Clerk for 1834.
Decatur	6,896	6,260	6,064			230		118 53	93 78	101 82		314 13	471 20	3 75		No return for 1835.
Daviess				765			10			10 00	10 00	15 00				No return till 1835.
Fountain	2,130	3,250	4,314	2,505	13	31	32	13 46	69 74	88 02	49 47	258 29	387 43	236 22		No returns of lands or tax till this year.
Franklin	4,384	3,166	1,715	1,207			23				22 07	22 07	33 10	66 75		
Fayette	695	380	1,767	639	7	12	26	74 69	44 55	28 63	26 03	179 60	269 45	163 71		No return for 1834.
Gibson	2,060	654		087			418	14 10	45 2 73	6 78	2 70	22 66	33 99	25 32		No return for 1834.
Greene	2,397	1,874	1,816	1,081			96	2 18	43 5 41		38 29	27 40	24 63	21 48		No return for 1834.
Harrison			2,040							25 14						No return for 1834.
Hendricks	1,120	776		5,493				13 44	8 92		8 64	31 00	46 50	17 83		No return till 1835.
Hancock											36 00	36 00	54 00			No return till 1835.
Hamilton	591			2,144			42	10 14				10 14	15 21	17 33		No returns of land but for 1832.
Henry			1,632	3,100			59			30 56	83 25	113 81	170 71	20 11		No return till this year.
Jackson		320	1,360	1,918			64			4 86	26 66	31 52	47 28	2 21		No return for 1832 and 3.
Jennings	3,916	1,533	1,321		14	12	6	79 14	35 44	28 92	143 50	215 25	151 29			No return for 1832, and no tax named for 1835.
Johnson	812	932	968	420		8	73	8 11	7 44	10 81	6 43	32 91	49 36	43 10		No return for 1835.
Knox		16,149	1,564	7,202			150	69	236 30	107 68	238 55	982 43	1473 64	233 46		This includes taxes of 1830-1-2-3-4 and 5.
Lawrence	3,721	2,315	4,276	2,633			46	20 18	45 87	52 38	30 95	149 38	224 07	164 67		No town lots returned.
Montgomery	1,840	2,232	5,308	6,094				45 41	44 64	112 16	117 37	319 58	479 37	124 00		No return for 1835.
Morgan	192		960		16		1	4 64		12 89		17 53	26 50			No return for 1833 and 5.
Marion	2,762	6,782	5,870	5,889			96	52 79	00 69	89 04	80 41	257 12	385 68	270 74		No list of lands or lots for 1832-3 and 4.
Marin				1,877			111	71 39			55 07	126 46	189 69	23 46		No return of town lots.
Mourne	889	2,595	1,440	320				4 85	17 35	11 52	3 20	36 99	55 38	23 75		No return for 1834 and 5.
Orange	1,018	920			137			15 92	9 62	7 18		21 84	32 76	19 63		No return for 1835.
Owen				1,391								21 62	32 43	10 80		No returns of lands for 1833-4 and 5.
Parke	1,407			4,145			3	21 62				48 72	48 72	73 06		No return but for 1835.
Posey				1,155			13			54 35	48 00	24 46	126 81	190 21	44 10	No return for 1832.
Pike		2,870	2,078				3			12 79	20 00		32 79	49 18		No returns for 1834 and 5.
Putnam	1,066	1,664						21 45	87 37	47 76	56 61	226 59	324 88	132 93		No return of town lots for 1832-3 and 4.
Ripley	3,079	2,780	7,173	3,768	34	16	11	7 03	11 89	8 00	8 73	37 55	56 32	69 99		No return previous to 1835.
Randolph	1,804	1,982	1,545	636				30 22	74 10	62 34	06 43	110 68	166 02	78 36		The delinquent lands of 1830-1-2 and 3 are embraced.
Rush	4,658		2,140	1,833	81	34	34				34 02	34 02	51 03			No return previous to 1835.
St. Joseph				1,708			57	57 23	92 27	50 00	74 91	274 41	411 61	69 80		No return previous to 1835.
Switzerland	10,171	16,220	4,253	1,176							26 24	39 36				The delinquent lands of 1830-1-2 and 3 are embraced.
Shelby	3,951	1,763	1,964	5,537			36	23 70	10 57	23 57	73 77	131 61	197 41	140 09		No return for 1832 and 4, and no return of redemption.
Sullivan				173						14 21		3 99	18 20	27 30		No return for 1832.
Tippecanoe	884	2,440	234		50	77	62	15 93	45 27	68 21		78 59	117 86	69 91		No return for 1832 and 5.
Union	817	2,728	2,103			98		8 66	33 65	36 28		104 13	156 19	6 63		No return for 1833.
Vermilion	1,536	1,846	1,733	950			16	27 77	35 46	34 31	5 70	103 27	154 84	84 41		No return for 1833.
Vigo	7,832	5,362	2,726	5,767			10	11 13	74 96	72 63	73 103	43 380	64 82	120 32		No return of lands for 1833-4 and 5.
Vanderburgh		877	3,006				58			18 11	98 05					No return for 1832 and 5.
Warren	80		124	3,731			67		1 28		16 55	120 02	137 65	906 77	3 09	No return for 1833.
Washington	643				16	33	23	13 12	47 18	44 10	7 16	48 83	73 24	23 50		No return of lands for 1833-4 and 5.
Warrick		472	160				3			4 93		4 93	7 39	2 42		No return for 1832 and 1835.
Wayna	1,030	294	200		85	73		15 02	5 63	2 00		22 65	33 97	4 40		No return for 1835.





H. B.

REPORT

W. M. DODD

CONSTITUTIONAL HISTORY

EXHIBIT NO. 1

Report of the Committee on

1890. 1/10/10

of the House of Representatives

1890

Report of the Committee on the Constitution of the House of Representatives, 1890.

1890. 1/10/10

The Committee on the Constitution of the House of Representatives, 1890.

1890. 1/10/10

20  
**H. R.**

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**REPORT**

OF

**D. M'DONALD,**

**PROSECUTING ATTORNEY.**

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**JANUARY 22, 1836.**

**Referred to the Judiciary Committee.**

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**HON. CALEB B. SMITH,**

*Speaker of the House of Representatives :*

**SIR—**

Pursuant to law, I herewith submit to be laid before the House of Representatives a statement of the proceedings against the Wabash Insurance Company.

Very respectfully,      **DAVID McDONALD.**

The undersigned, agreeably to the provisions of an act of the Legislature at the last session, instituted in the Knox Circuit Court, (March term, 1835), proceedings against the Wabash Insurance Company, by a *quo warranto* information. As that act did not authorize the court to render a judgment of forfeiture of the Company's charter, the only inquiry was, *by what warrant* they had entered into banking business by issuing bills and notes as a circulating medium. The Court, on a disclaimer of any right to exercise the franchise in question, rendered judgment of *ouster* against the Company. This, it is believed, is the only judgment the act of Assembly would warrant against the corporation; and it necessarily brought the proceeding to a close.

The undersigned asks leave to suggest, that since the rendition of the judgment aforesaid, he believes the Wabash Insurance Company have wholly ceased to issue the notes in question.

Respectfully submitted,

**DAVID McDONALD,**

*Att'y Pros. of the 7th Jud. Ct. of the State of Ia.*

*Washington, (Ia.) Jan. 1, 1836.*

H. R.

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**TABLE**

OF

**ALTITUDES IN INDIANA.**

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JANUARY 20, 1836.

Read, laid on the table, and 1200 copies ordered to be printed.

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*To the General Assembly of the State of Indiana.*

The undersigned have the honor to submit herewith a Table of Altitudes, embracing two hundred and eight different points within the State, and giving the elevation of each with regard to the plain on which the Capital of the State is built; high water of the Ohio at the head of the Falls; the surface of Lake Erie, and tide water in the Hudson. The particular object of this table is fully explained in the reports of the 15th and 17th December last.

HOWARD STANSBURY,  
*U. S. Ass't Civ'l Engineer.*  
JESSE L. WILLIAMS,  
*Civil Engineer.*



# TABLE OF ALTITUDES IN INDIANA.

2

	Elevation with reference to bottom of canal at Indianapolis, in feet.	Elevation with reference to High-water mark in the Ohio river at head of Falls, in feet.	Elevation with reference to Lake Erie, in feet.	Height above Tide Water in the Hudson river, in feet.
<i>Canal Survey along the White-water Valley.</i>				
Surface of White-water at Mouth of Nettle creek	262	530	396	960
Surface of do at National road	218	486	352	916
do of ground in Milton	228	496	362	926
do of ground in Connersville	125	393	259	823
do of White-water at Conwell's Dam — miles below Connersville	80	348	214	778
do of White-water at Somers		268	134	698
do of White-water at Brookville	100	168	34	598
do of White-water at Harrison	204	64	70	494
Bottom of canal at Elizabethtown	221	47	87	477
High-water mark at Lawrenceburgh	216	52	82	482
<i>Rail road Survey from Indianapolis to Lawrenceburgh.</i>				
Pleasant run at crossing of Michigan road	45	313	179	743
Lick creek at do do	87	355	221	785
Belles' Inn on Michigan road, between Lick creek and Big run	152	420	286	850

Big run at crossing of Michigan road	-	-	-	116	a	384	a	250	a	814	a
Buck creek do	-	-	-	61	a	329	a	195	a	759	a
Sugar creek do	-	-	-	46	a	314	a	180	a	744	a
Little Sugar creek	-	-	-	56	a	324	a	190	a	754	a
Brandywine creek	-	-	-	59	a	327	a	193	a	757	a
Big Blue river	-	-	-	41	a	309	a	175	a	739	a
do	-	-	-	59	a	327	a	193	a	757	a
Shelbyville	-	-	-	99	a	367	a	233	a	797	a
Big Flat Rock river	-	-	-	196	a	464	a	330	a	894	a
Summit between Big Flat-rock river and Clifty creek	-	-	-	161	a	429	a	295	a	859	a
Clifty creek	-	-	-	206	a	474	a	340	a	904	a
Muddy fork Sand creek	-	-	-	246	a	514	a	380	a	944	a
Greensburgh	-	-	-	215	a	483	a	349	a	913	a
Main Sand, creek	-	-	-	359	a	627	a	493	a	1057	a
Summit between heads of Sand creek and heads of Salt creek	-	-	-	213	a	481	a	347	a	911	a
Main Laughery creek	-	-	-	303	a	571	a	437	a	1001	a
Summit between Laughery and heads of Ripple creek	-	-	-	297	a	565	a	431	a	995	a
Sources of Hogan creek	-	-	-	315	a	583	a	449	a	1013	a
Head of Tanner's creek	-	-	-	225	b	43	a	91	b	473	a
Main street, Lawrenceburgh	-	-	-								

*Rail road Survey from Indianapolis to Madison.*

Surface of Pleasant run	-	-	-	15	b	253	a	119	a	683	a
do Lick creek	-	-	-	13	a	281	a	147	a	711	a
Buck creek	-	-	-	43	a	311	a	177	a	741	a
do of 2d fork of Pleasant run	-	-	-	77	a	345	a	211	a	775	a
do of Pleasant run	-	-	-	99	a	367	a	233	a	797	a

Summit of Ridge between E. and W. forks of White river  
 Surface of Sugar creek - - -  
 do of Blue river - - -  
 Town of Edinburgh - - -  
 Surface of Flat rock river - - -  
 do of Haw creek - - -  
 do of Clifty creek - - -  
 Surface of Little Sand creek - - -  
 do of Big Sand creek - - -  
 do of the town of Vernon - - -  
 do of Muskakatack at Vernon - - -  
 do of Graham fork of Muskakatack - - -  
 do of Big creek - - -  
 do of Middle fork of Big creek - - -  
 Summit of ridge between Ohio and Muskakatack - - -  
 High-water mark of the Ohio at Madison - - -

165	a	433	a	299	a	863	a
38	b	230	a	96	a	660	a
58	b	210	a	76	a	640	a
43	b	225	a	91	a	655	a
96	b	172	a	38	a	602	a
96	b	172	a	38	a	602	a
102	b	166	a	32	a	596	a
92	b	176	a	42	a	606	a
104	b	164	a	30	a	594	a
59	b	209	a	75	a	639	a
99	b	169	a	35	a	599	a
28	b	240	a	106	a	670	a
27	a	295	a	161	a	725	a
35	a	303	a	169	a	733	a
180	a	448	a	314	a	878	a
248	b	20	a	382	a	450	a

*Canal Survey from Indianapolis to Madison.*

Surface of White river at Port Royal - - -  
 Surface of White river at mouth Bean Blossom - - -  
 do of do at Bloomfield - - -  
 do of do opposite Washington - - -  
 do of Driftwood 4 mile above its mouth - - -  
 do of gap in the ridge between Patoka and White river - - -  
 do of Patoka at crossing of canal line - - -

84	b	184	a	50	a	614	a
169	b	99	a	35	b	529	a
231	b	37	a	97	b	467	a
295	b	27	b	161	b	403	a
308	b	40	b	174	b	390	a
240	b	28	a	106	b	458	a
310	b	42	b	176	b	388	a





Surface at Greenville	-	-	-	61	a	329	a	195	a	759	a
do at Blue river	.	.	.	129	b	139	b	5	a	569	a
do at Fredericksburgh	.	.	.	101	b	167	b	33	a	597	a
Paoli court house	.	.	.	99	b	169	b	35	a	599	a
Surface of Lost river at crossing of present road	.	.	.	271	b	3	b	137	b	427	a
White river, East fork, low water	.	.	.	267	b	1	b	133	b	431	a
Mount Pleasant	.	.	.	114	b	154	b	20	a	584	a
Washington	.	.	.	206	b	62	b	72	b	492	a
White river, West fork, low water	.	.	.	290	b	22	b	156	b	408	a
do high water	.	.	.	275	b	7	b	141	b	423	a
Summit of ridge between Wabash and West fork of White river	.	.	.	145	b	123	b	11	b	553	a

*Turnpike Survey from New Albany to Crawfordville.*

Summit of knobs between New Albany and Greenville	.	.	.	210	a	478	a	344	a	908	a
do of do Greenville and Blue river	.	.	.	202	a	470	a	336	a	900	a
Surface of branch of Blue river	.	.	.	31	b	237	a	103	a	667	a
Summit between branches of Blue river	.	.	.	255	a	523	a	389	a	953	a
Salem, court house	.	.	.	35	a	303	a	169	a	733	a
Surface of branch of Blue river	.	.	.	16	b	252	a	118	a	682	a
Surface of Blue river at Salem	.	.	.	9	a	277	a	143	a	707	a
Summit between Blue river at Salem, & Waters of White riv. at Bono	.	.	.	191	a	459	a	325	a	889	a
Bono	.	.	.	45	b	223	a	89	a	653	a
East fork of White river, surface of low water	.	.	.	224	b	44	a	90	b	474	a
Leatherwood cr. surface low water, 100 yds. above Hempstead's mill.	.	.	.	202	b	66	a	68	b	496	a
Guthrie's creek, surface low water	.	.	.	231	b	37	a	97	b	467	a

Bedford, court house	.	.	.	.	18	b	250	a	116	a	680	a
Surface of Salt creek	.	.	.	.	233	b	35	a	99	b	465	a
Bloomington, court house	.	.	.	.	73	a	341	a	207	a	771	a
Surface, low water, of Bean Blossom creek	.	.	.	.	162	b	106	a	28	b	536	a
do low water of West fork of White river	.	.	.	.	163	b	105	a	29	b	535	a
Gospport on the hill	.	.	.	.	105	b	163	a	29	a	593	a
Greencastle, court house.	.	.	.	.	132	a	400	a	266	a	830	a
Surface of low water of Walnut fork of Eel river	.	.	.	.	41	b	227	a	93	a	657	a
do of low water of Raccoon creek	.	.	.	.	14	a	292	a	148	a	712	a
Crawfordsville, court house	.	.	.	.	46	a	314	a	180	a	744	a

*Rail-road Survey from Indianapolis to Lafayette, via Danville and Crawfordsville.*

Summit of ridge between Eagle and White Lick creeks	-	-	-	-	141	a	409	a	275	a	839	a
Surface of White Lick creek	-	-	-	-	55	a	323	a	189	a	753	a
Summit of ridge between heads of White Lick and heads of Eel river	-	-	-	-	329	a	597	a	463	a	1027	a
Surface of East Fork of Eel river	-	-	-	-	156	a	424	a	290	a	854	a
do of Middle Fork of do	-	-	-	-	156	a	424	a	290	a	854	a
do of West Fork of do	-	-	-	-	156	a	424	a	290	a	854	a
Summit of ridge between heads of Eel river and Raccoon creek	-	-	-	-	221	a	489	a	355	a	919	a
Surface of Raccoon creek	-	-	-	-	101	a	369	a	235	a	799	a
do of Sugar creek $\frac{1}{2}$ mile from Crawfordsville Court House	-	-	-	-	55	b	213	a	79	a	643	a
Summit of ridge between Sugar creek and heads of Wea creek	-	-	-	-	124	a	392	a	258	a	822	a
Surface of Wea creek near its head	-	-	-	-	7	a	275	a	141	a	705	a
do of do 4 miles from Lafayette	-	-	-	-	100	b	168	a	34	a	598	a
Danville Court House	-	-	-	-	245	a	513	a	379	a	943	a

*Rail road Survey from Indianapolis to Lafayette direct.*

Surface of Eagle creek	-	-	-	-	-	41	a	309	a	175	a	739	a
do of Little Eagle creek	-	-	-	-	-	10	a	278	a	144	a	708	a
Summit between Big and Little Eagle creeks	-	-	-	-	-	109	a	377	a	243	a	807	a
do between Big Eagle and Sugar creeks	-	-	-	-	-	254	a	522	a	388	a	952	a
Surface of Sugar creek or Rock river	-	-	-	-	-	81	a	349	a	215	a	779	a
Summit between Sugar creek and the Wabash at Lafayette	-	-	-	-	-	110	a	378	a	244	a	808	a
Court House at Lafayette	-	-	-	-	-	160	b	108	a	26	b	538	a

*Survey of a Canal from Indianapolis to the Wabash and Erie Canal.*

Surface of White river at mouth of Stoney creek	-	-	-	-	-	37	a	305	a	171	a	735	a
do of ground in Noblesville	-	-	-	-	-	52	a	320	a	186	a	750	a
do of White river at Andersonstown	-	-	-	-	-	124	a	392	a	158	a	822	a
do of ground at Andersonstown	-	-	-	-	-	176	a	444	a	310	a	874	a
do of White river at Muncietown	-	-	-	-	-	221	a	489	a	355	a	919	a
do of prairie north of Muncietown	-	-	-	-	-	244	a	512	a	378	a	942	a
do of Mississinewa north of Muncietown at outlet from Prairie	-	-	-	-	-	196	a	464	a	330	a	894	a
do of Pipe creek at James' mill	-	-	-	-	-	128	a	396	a	262	a	826	a
do of summit between Kill-buck and Pipe creeks	-	-	-	-	-	167	a	435	a	301	a	865	a
do of Mississinewa at Marion	-	-	-	-	-	86	a	354	a	220	a	784	a
Pipe creek summit level	-	-	-	-	-	156	a	424	a	290	a	854	a

*Wabash and Erie Canal from State line to Terre Haute.*

Summit level of Wabash and Erie canal	-	-	-	-	-	47	a	315	a	181	a	745	a
Surface of Maumee at State line	-	-	-	-	-	6	b	262	a	128	a	692	a

Surface of the Maumee at Fort Wayne	-	-	-	-	22	a	290	a	156	a	720	a
Average level of ground in Fort Wayne	-	-	-	-	55	a	323	a	189	a	753	a
Surface of Wabash at mouth of Little river	-	-	-	-	16	b	252	a	118	a	682	a
do of Wabash at mouth of Salamonia	-	-	-	-	49	b	219	a	85	a	649	a
Bottom of canal at the town of Wabash	-	-	-	-	48	b	220	a	86	a	650	a
Surface of the Wabash at the town of Wabash	-	-	-	-	60	b	208	a	74	a	638	a
do of the Wabash at the mouth of Mississinewa	-	-	-	-	39	b	179	a	45	a	609	a
do of the Wabash at the mouth of Eel river	-	-	-	-	136	b	132	a	2	b	562	a
do of the Wabash at the mouth of Tippecanoe	-	-	-	-	196	b	72	a	62	b	502	a
do of the Wabash at Lafayette	-	-	-	-	206	b	62	a	72	b	492	a
do of the Wabash 3 miles below Clinton	-	-	-	-	258	b	10	a	124	b	440	a
do of the Wabash at Terre Haute	-	-	-	-	265	b	3	a	131	b	433	a
Bottom of canal at Terre Haute	-	-	-	-	252	b	16	a	118	b	446	a

*Canal Surveys from Lake Michigan to the Wabash and Erie Canal.*

Summit level of canal from L. Michigan to F't Wayne, surveyed in 1830	245	a	513	a	379	a	943	a
Summit level of the St. Joseph & Kankakee canal, surveyed in 1830	2	b	266	a	132	a	696	a
Surface of Pigeon lake—summit between St. Joseph of Lake Michigan and St. Joseph of Maumee	248	a	516	a	382	a	946	a
Surface of Little Fish lake, source of Fish creek	180	a	448	a	314	a	878	a
do of St. Joseph of the Maumee 2 miles below mouth of Fish cr.	80	a	348	a	214	a	778	a
do of St. Joseph of Lake Michigan at mouth of Little Elkhart	34	a	302	a	168	a	732	a
do of Elkhart river at its mouth	8	a	276	a	142	a	706	a
do of Big St. Joseph, 8 miles above South Bend	24	b	244	a	110	a	674	a
do of Yellow river at crossing of canal line 10 miles from its mouth	8	b	260	a	126	a	690	a
do of Devil lake in St. Joseph county	3	a	271	a	137	a	701	a



*Levels in various sections of the State, ascertained by Random Level Party.*

Surface of White river at crossing of National Road	29	b	239	a	105	a	669	a
do of Pogue's run, Meridian street, Indianapolis	10	b	253	a	124	a	688	a
do of Pleasant run at crossing of state road from Ind's to Madison	15	b	253	a	119	a	683	a
do of Lick creek at crossing of state road from Ind's to Madison	5	a	273	a	139	a	703	a
do of ground on summit between Young's creek and Pleasant run	95	a	363	a	229	a	793	a
do of Franklin—Court-house door-sill	24.35	a	292.35	a	158.35	a	722.35	a
do of Hurricane creek at Franklin	5	a	273	a	139	a	703	a
do of Sugar creek, crossing of road from Franklin to Shelbyville	11	b	257	a	123	a	687	a
do do at crossing of Michigan road	54	a	322	a	188	a	752	a
do of Brandywine creek at crossing of Michigan road	60	a	328	a	194	a	758	a
do of Blue river at Shelbyville	42	a	310	a	176	a	740	a
do of do Marion	78	a	346	a	212	a	776	a
do of Sugar creek, crossing of Indianapolis & Madison state road	41	b	227	a	93	a	657	a
do of Blue river, do do	52	b	216	a	82	a	646	a
do of Flat Rock do do	90	b	178	a	44	a	608	a
do of Driftwood at Columbus	104	b	164	a	30	a	594	a
do of Haw creek south of Columbus	97	b	171	a	37	a	601	a
do of Clifty creek 1 mile from its mouth	110	b	158	a	24	a	588	a
do of Little Sand creek 1 mile from its mouth	119	b	149	a	15	a	579	a
do of Big Sand creek one mile from its mouth	132	b	136	a	2	a	566	a
do of Driftwood at Rockford below mill-dam	150	b	118	a	16	b	548	a
Summit between Driftwood and Mutton creek, near Rockford	86	b	182	a	48	a	612	a
Surface of Muskatitack at Stanford's mill	172	b	96	a	38	b	526	a
do of do at mouth of Graham's Fork	157	b	111	a	23	b	541	a
do of do at Slate ford	185	b	83	a	51	b	513	a
do of Pigeon-roost creek at Vienna	149	b	119	a	15	b	549	a

do	of ground in Collins' Gap, Sec. 19, T. 2 N. of R. 7 E., being	80	b	188	a	54	a	618	a
the	lowest gap in the ridge between White river and the Ohio, east	299	a	567	a	433	a	997	a
of	Dubois county	60	a	328	a	194	a	758	a
B. M.	on top of knob on road from Salem to Lexington, 8 m's W. Vienna	16	b	252	a	118	a	682	a
Surface	of ground in Salem	67	a	335	a	201	a	765	a
do	of branch of Big Blue river near Salem	158	a	426	a	294	a	856	a
do	of ground in Livonia	270	b	2	b	136	b	428	a
B. M.	on ridge at crossing of Paoli and New Albany road	282	b	14	b	148	b	416	a
Surface	of the Patoka above mill dam at Jasper	7	b	261	a	127	a	691	a
do	of the Driftwood at Hindostan	169	a	437	a	303	a	867	a
do	of Fall creek at crossing of Michigan road	99	a	367	a	233	a	797	a
Summit	of Prairie between Andersonstown and Pendleton	88	a	356	a	222	a	786	a
Surface	of Mississinewa at R. McCormick's	103	a	371	a	237	a	801	a
do	of Salamonina at crossing Fort Wayne state road	86	a	354	a	220	a	784	a
do	of do 8 miles above crossing of do	60	a	328	a	194	a	758	a
do	of Rock creek at crossing of Fort Wayne state road	73	a	341	a	207	a	771	a
do	of Wabash at crossing of do								
do	of do 8 miles above the crossing of do								



R. R.

## REPORT

OF THE

## CANAL FUND COMMISSIONERS.

JANUARY 26, 1836.

Read, referred to the committee on Canal Fund & 1,000 copies ordered to be printed.

Hon. C. B. Smith,

*Speaker of the House of Representatives:*

SIR—Please lay the inclosed Report before the House of Representatives.

Very respectfully yours,

NICHOLAS McCARTY.

SAM'L HANNA.

OFFICE OF THE CANAL FUND COMMISSIONERS, }  
January 23, 1836.

*To the General Assembly of the State of Indiana:*

The Canal Fund Commissioners, having completed the settlement of the Canal Commissioners account to the 1st Dec. last, and other accounts to the present time, are now prepared to report there receipts and expenditures since the 1st of January 1835, with the funds on hand.

There was on hand and due at the date of the last report \$58,125 39

Since which there has been received,

From sale of \$300,000 five per cent state bonds, 27 Feb.  
at \$2.05 per cent. premium,

306,150 00

From sale of \$65,257.42 5 per cent. to Secretary of  
War at 7 per cent. premium, deducting interest from  
17th April, when money was received to 1st July,



when Bonds commenced drawing interest,	69,154	97
From sale of \$200,000 five per cent. August 3d, at 5 per cent. premium,	210,000	00
From sales of 40,000 do Sept. 8th, at 5 per cent. premium,	42,000	00
Bank interest which had accrued on \$340,000 of loan before receipt of money,	3,229	56
Proceeds of sale of \$450,000 state 5 per cents. for Bank at $4\frac{1}{2}$ per cent., and Bank interest on \$50,000	470,666	66
Of Merchants' Bank interest charged thereto on deposits to 1st Dec. last,	7,851	21
From Canal Lands,		
Received on sales from 25th Nov. 1834 to 25th Nov. 1835,	\$49,004	90
And interest 1 year in advance on the same	8,361	91
Amount, full payment on previous sales,	7,778	23
" interest on lands sold prior to Nov. 25, 1834,	8,897	77
	<u>74,042</u>	<u>81</u>
From the estate of Wm. C. Linton, deceased, interest on his account and premium and interest on draft of \$3,368.03 now paid,	194	37 $\frac{1}{2}$
From John Spencer, late disbursing agent for premium on draft of \$4,500 of last year and interest on his account which is now paid,	496	87
From Samuel Hanna, premium on \$4000 draft paid on Canal,	20	00
From State Bank premium and interest on draft of \$2000 repaid,	23	32
Of Canal Fund Commissioners \$12 received for trespass on Canal and \$3 on account of error in contractor's receipt of last year,	15	00
	<u>\$1,241,970</u>	<u>16</u>
And there has been paid out on account of temporary loan of Merchants' Bank due at date of last report, and paid out of loan of Feb. last,	97,523	48
To contractor's on canal, (including \$100 on last year's account,)	319,219	68
For incidental expenses on canal line including \$875 paid for right of way, and \$600 for lots for water power,	16,483	13
For survey of Centre Canal.	10,630	62
" do of continuation of Wabash and Erie Canal via Terre Haute,	4,487	56
For survey of White Water canal last year \$944.81 making releases \$47	991	81
Gov. Noble on account rail road surveys,	18,553	50
State Bank, the amount received from sale of its state Bonds,	470,666	66

To State Bank the interest which accrued on its loan to 1st Dec.	2,183 45
To Indianapolis and Lafayette Banks, interest on temporary loan for canal,	63 65
To the same, interest on our drafts on Merchants' Bank after due at 4 per cent.,	381 42
For Fund Commissioners per diem and expenses,	1,736 46
To the estate of Wm. C. Linton, deceased, per diem and expenses of last trip East, and of last sickness and funeral charges in Philadelphia and \$28.09 on account of last year's expenses,	445 09
Expense of engraving, printing, and filling State Bonds, advertising loans, printing laws, postage, stationary, and clerk hire,	932 04½
Paid Auditor's salary on account of Canal Fund to 1st Dec.	137 50
Paid late Treasurer's claim for services, by cancelling debt due from state,	136 05½
For blank account and record books,	54 50
For ½ years interest on \$100,000—6 per cent. and \$300,000—5 per cent. State Bonds,	10,500 00
Expense of selling Canal Lands,	961 00
And there is on hand and due Fund,	
Deposited in Merchants' Bank N. Y. at 4 per cent. interest,	\$221,488 85
Deposited in Fort Wayne Branch Bank,	29,817 41
“ in Indianapolis Branch Bank,	2,052 64½
Due from State Bank,	1,026 54½
In the hands of the Canal Commissioners,	31,499 97
“ of Jeremiah Sullivan,	7 12½
	285,892 54½
	<hr/>
	\$1,241,970 16

And they would further Report:

That the whole expense of the Wabash and Erie Canal, including the incidental expenses on canal, and those for procuring and managing Fund are,	581,608 44
And the nett proceeds of receipts for Canal Lands, after deducting expenses of selection and sale, are,	169,245 82½
And there have been sold of State Bonds at 6 per cent. interest,	100,000 00
Of 5 per cent.,	605,257 52
	<hr/>
	\$705,257.42

And the Commissioners, under the act of last year, are authorized to loan the further sum of

121,742.58

Whole amount of the loan authorized, \$827,000 00

The loan for the State Bank was placed to the credit of the Fund

Commissioners in the Merchants' Bank that it might be on interest until drawn; by which the State Bank has received \$2,183.42 interest thereon, to the 1st Dec. last.

And the Board would further remark, that there is a difference between the amount of interest here charged the Merchants' Bank and the credit they have given us, subject to future settlement; and that the sum deposited in the Merchants' Bank was subject the 1st inst. to payment of interest on all the loans made for canal purposes amounting to about \$16,000.

As the laws in relation to the duties of the Fund Commissioners seem to invite such suggestions as may be thought important to further the interest of the state in procuring loans; your Board would respectfully recommend, as calculated to facilitate that object, that an appropriation be made of some specific fund for the payment of the interest on the loan contemplated by the act of the present General Assembly, and that the same when required for that purpose be paid over to the Commissioners of the Canal Fund.

And as it may sometimes be impossible to procure the signature of every member of the Board to the Bonds of the State they are authorized to execute, we would recommend that provisions be made by law that in all cases the signature of a majority of the Board shall be sufficient.

In negotiating loans for a number of successive years it may sometimes happen, as it has heretofore, that permanent loans cannot be made advantageously to the state, or on terms authorized by law in time to meet the demand on the fund, from work already under contract, or in progress. To remedy which, the undersigned would recommend that authority be given to contract for temporary loans on the best terms they can be procured not exceeding six per cent., until permanent loans can advantageously be obtained, as a saving may thereby perhaps sometimes be made and interruption to the progress of the work prevented.

The same reasons would suggest the propriety of a discretionary power being given to the Commissioners, to create a six per cent, stock instead of five, with the additional one that there may be times when a six per cent. stock may command so much higher premium than a five, as to make it the most profitable loans.

And they would further suggest that it would add to the confidence of capitalists in the stocks, if a *sinking fund* for eventual redemption of the Bonds was provided by the state.

If the Legislature should deem it expedient to appropriate all premiums received, to be loaned as the commissioners of the sinking fund are loaning funds committed to their charge, it would do much towards accomplishing the object; and if from premiums and other sources twelve dollars on each hundred of stock, should be appropriated for that purpose, and loaned at 8 per cent, interest per annum in advance, it would in 25 years pay the entire principal.

Respectfully submitted,

NICHOLAS McCARTY.  
SAML. HANNA.



23  
H. R.

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**REPORT**

OF THE

**COMMITTEE OF AGRICULTURE**

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JANUARY 30, 1836.

Read, laid on the Table, and ordered to be printed.

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Mr. Morris, from the committee on agriculture made the following report:

Mr. SPEAKER—

The committee on agriculture, to which were referred the several communications made to the House from the State Board of Agriculture, have had the same under consideration, and report:

From an examination of the documents referred to, it appears that the law of last year for the encouragement of agriculture, has been productive of much good. Under it a State Board of Agriculture, a State Agricultural Society, and a number of county agricultural societies have been organized. From the returns sent up to the State Agricultural Society at their meeting in December last, it is evident that within the year past quite an agricultural revolution has been produced in many counties. Your committee therefore entertain hopes, that by the next meeting of the society, it will be found that, that not only has each county a well organized society, but that each society will be represented at that meeting.

The reports of the State Board suggest amendments to the present law, which have been duly considered by your committee; some of them they have embodied in a bill herewith reported, entitled "a bill to amend the act for the encouragement of agriculture," approved Feb



ruary 7, 1835. As several of the documents referred to the committee contain general information upon the subject of agriculture, it is believed by your committee that they would be read by every part of the community with interest. They therefore recommend the adoption of the following resolution:

*Resolved*, That documents accompanying this report, Nos. 1, 2, 3, 4, 5, and 6, be printed in pamphlet form for public distribution.

## ANNUAL REPORT OF THE STATE BOARD OF AGRICULTURE.

*To the Honorable Legislature of the State of Indiana:*

Agreeably to the provisions of "an act for the encouragement of agriculture," approved February 7th, 1835, it becomes the duty of the State Board of Agriculture to make report to the Legislature.

In entering upon the duties of their appointment, the first object to which the Board directed their attention, was the formation of agricultural societies in the several counties in the State. To facilitate this object, the Board prepared, printed and circulated throughout the state, a circular address, containing such instructions and advice as it was thought would most likely be effectual, accompanied by a form of by-laws and general regulations for the government of the respective county societies.

In a considerable number of counties, societies have been formed and regularly organized. A portion of these have held agricultural fairs, which have been productive of the most happy and encouraging results. A few of the societies sent up delegates to the annual meeting of the State Society, and sent in their annual reports. An abstract of the reports received, accompanies this report, marked A.

The law contemplates the collection by the State Board, from the reports of county societies, of such information on the local condition of agriculture in the several counties, as should enable the Board to lay before the Legislature, something like correct and authentic agricultural statistics of the whole state. This object however, cannot be attained the present year; for in many counties organizations have not yet taken place, and in others, their organizations have so recently occurred, that they have neither had time to obtain the requisite information, nor to get into a regular and systematic course of operation. Considering the time, and all the circumstances, the Board are of opinion that the law has been productive of very desirable effects. Enough has already been done to beget a new feeling on this subject, and give most hopeful promise of the ultimate and complete success of the plan. In some counties, quite an agricultural revolution has been produced; and in all the local reports, are to be found items of cheering intelligence, or plans promising future usefulness.

When this system of annual reports from county societies shall become perfected, it will enable the Board to lay before the Legislature in year, an exhibit of the kinds, quantities, and value of products

and manufactures in each county in the state, which cannot fail to be highly interesting and useful to all.

In the provision made in the law for an annual convention of delegates from all parts of the state, to devise plans for promoting the common cause, the Board recognize an arrangement calculated to give to the general interests of agriculture, a powerful and highly beneficial impulse. The late annual state meeting, appreciating the importance of this matter, resolved to ask of your honorable body for such amendment of the law as shall provide in future meetings, a delegate from each county. The proposed amendment has been made the subject of a special communication from a committee of the State Board, and is therefore already before you.

The recent meeting of the State Society, though not very fully attended by county delegates, was nevertheless interesting, and we think, highly beneficial to the interests of agriculture. A copy of the proceedings of that meeting, is herewith transmitted, marked B.

The subject of an agricultural library has claimed the attention of the Board, as one of interest and great value to the common concern; but as that subject was taken up by the State Society, it has already been laid before your body by an order of that meeting.

Impressed with the necessity, to the prosperity of our agricultural operations, of more extensively introducing into this State, improved breeds of cattle and other domestic animals, a committee has been appointed to collect information and digest plans for the more effectual accomplishment of this object.

The introduction of the culture of cotton, tobacco, and silk, into our state, are subjects to which the attention of the Board has been directed by resolutions of the State Society. The two first have been referred to a select committee, for inquiry and future report; and the report of a committee appointed on that subject, is herewith inclosed, on the culture of silk; which we commend to your notice, marked C.

The Board have been desirous to increase the amount of useful information to be collected by them, by prosecuting a correspondence with distinguished agriculturists in different parts, but as no means were placed at their disposal, for this, or any other object, they have been in a great measure cut off from this desirable source of valuable intelligence. The propriety is submitted to the Legislature, of placing at the disposal of the Board, a small sum for this, and similar uses.

The want is very seriously felt, both of an agricultural periodical suited to our portion of country and the condition of our agriculture, and also of an elementary book, affording a plain, comprehensive, and useful view of the science and practice of agriculture. The first of these subjects was, by the State Society, referred to a committee, and they have hopes of effecting a satisfactory arrangement, for the publication of a periodical of the kind in question. In regard to the other, a manual of agriculture, it is for your body to consider whether the general interests of agriculture might not be promoted by directing the compilation of such a work, a portion of which should be taken by the State for distribution in the different counties.



In adopting a general system of agricultural improvement, every available auxiliary means should be put in requisition, which promises beneficial results; hence the Board would be pleased to see an agricultural, in connection with a geological survey of the state, as recommended by the Executive. In other countries so high a value is placed on these surveys, that they are prosecuted with great minuteness, and at an immense expense of government. Here, little need be expended, especially when connected with a kindred object, to procure most valuable information.

Another subject to which the Board would very earnestly invite your attention, as vitally connected with the prosperity, honor, and usefulness of agriculture and agriculturists, is an experimental farm and agricultural school.

This important subject will be presented to your honorable body, in a separate communication accompanying this report, marked D.

It would probably be expecting unreasonable attention to our suggestions, to look for legislative action on all the points and measures proposed in this report; we have however, in accordance with the duty enjoined on us by the law, presented to your notice such subjects as we believe to be essentially connected with the great interests of agriculture in our state.

And whether our suggestions shall be regarded as of value or otherwise, we doubt not, those suggestions, and the great interest we have the honor in some sort to represent, will receive due attention and suitable action at your hands.

All which is very respectfully submitted,

In behalf of the State Board of Agriculture,

M. M. HENKLE, Sec'y.

## A

### ABSTRACT OF REPORTS FROM COUNTY SOCIETIES.

#### *REPORT from the Marion County Agricultural Society to the State Board.*

##### TO THE STATE BOARD OF AGRICULTURE:

In pursuance of the provisions of an act entitled, "an act for the encouragement of agriculture," approved February 7, 1835, the undersigned has the honor to lay before your Board, a brief account of the proceedings of the Marion County Agricultural society.

The Marion county Agricultural Society was formed in June last, by a few individuals, who proceeded to elect the officers. But few of our fellow citizens became members of the society, or evinced much interest in its proceedings, until, at a meeting of the board of managers in August, it was determined to hold a fair, after which, by the spirited

exertions of several individuals connected with the board of managers, our fellow-citizens were induced to come forward and give their names and their money to sustain the liberal views of the board of managers. The fair was appointed for the 30th and 31st days of October, and a liberal scale of premiums offered. In a very few days the amount necessary to meet the proposed premiums was made up, and an additional sum subscribed as premiums on articles not embraced in the proposition of the board of managers. The subscriptions of individuals were appropriated to the payment of premiums on the first class of articles, and for the purpose of paying the premiums on the second best articles the board of managers appointed a committee to petition the board of justices of Marion county for the appropriation of the fifty dollars, which, by the 10th section of the act of the General Assembly under which this society was formed, the boards doing county business in the respective counties, are authorized to donate to the agricultural societies in their respective counties. The proposition was met by the board in a spirit of liberality which deserves commendation, and they voted the appropriation without a dissenting voice. The fair was held at the time above mentioned, and the interest excited was greater than had been anticipated by the most sanguine friends of the society. The exhibition of animals and articles, considering the recent formation of the society and the surrounding circumstances, was highly respectable; and it is confidently believed that an interest has been excited which will greatly advance the agricultural improvement of Marion county, whose example, it is hoped, may have a salutary influence on the surrounding counties.

Donations exceeding \$200 have already been made by our merchants and mechanics towards meeting the demands of the next year. For the detailed operations of our society, I would respectfully refer you to the accompanying report of the Treasurer, which gives the number of members, the amount subscribed and paid by each, the amount received and paid out, &c. &c.

Respectfully submitted,

Dec. 12, 1835.

D. MAGUIRE, *Sec'y.*

From the report of the Treasurer, it appears that 142 members of the society have paid their subscriptions, amounting in all to \$228 00  
The appropriation of the County Board 50 00

	Total receipts	278 00
Amount paid in premiums and contingent expenses		184 00
Balance in Treasury 1st Dec.		<u>\$94 00</u>

Officers of the Society, { N. B. PALMER, *President.*  
V. President.  
DOUGLASS MAGUIRE, *Secretary.*  
C. FLETCHER, *Treasurer.*



*Jefferson County Society.*—This society was organized late the past season. Premiums for the next fair (none having been held the past fall) amounting to more than \$100 00, besides a premium of \$10 for the best course of farming in each of the townships in the county.

The Society has 125 members, and the most desirable effects are anticipated from its operation.

The officers are

WN. DUNN, Esq., President.  
 RICHARD HUBBARD, V. Prest.  
 WM. HENDRICKS, Jr., Rec. Sec.  
 GEO. ROBINSON, Cor. Sec'y.  
 MILTON STAPP, Esq., Treas'r.

*Union County Society.*—This society was formed about the 1st of July; the present number of members 59. Officers, James Leviston, President; W. H. Bennett, Vice President; Wm. Bryan, Rec. Secretary; J. L. Folger, Cor. Secretary; Douglass Crawford, Treasurer. Funds in treasury \$17 50. Paid for books, &c., \$1 50. An Agricultural fair was held in October, but certificates and not premiums were awarded.

*Union County, Nov. 30, 1835.*

"The state of agriculture in our county is flourishing. The staple commodities are pork, wheat, and corn. From the best information we have, we think our county produce about 15,000 good corn fed hogs last year for the Cincinnati market, besides sufficient for home consumption. The current year will fall short in numbers and quality, owing to the partial failure of corn crops for the two last years. Wheat crops have failed to a considerable extent for the last two years, little, if any more have been raised than would supply our own consumption; heretofore it has been and we hope will hereafter be a profitable production of our county. In addition to the above our county produces annually a considerable number of horses, fat cattle, and some mules for market.

The manufactures of our county are yet in their infancy, and but comparatively few in existence. We have two small woollen factories, which produce a considerable quantity of jeans, casinetts, and some blankets, all of a good quality; besides these we have a sufficient number of carding machines, flouring mills, &c. equal to the demand of our own citizens.

We are induced to believe that the formation of our society will exert a lasting and happy influence in our county. Many farmers have already, since the very recent establishment of our society, procured some of the most approved breeds of cattle and hogs; and there are some who have turned their attention to the improvement of horses and sheep.

We ave only in the cocnclusion to offer, as an apology for the indefiniteness of our report, the very short time that has elapsed since the formation of our society, and consequently the want of that accurate information which is always so necessary to furnish an accurate and definite statement of the facts required; and that we ardently hope our

next annual report, when compared with the present, will be the best evidence that can be offered to the State Board of the beneficial influence of the formation of our society."

*Putnam County Society* contains 40 members. Officers, Samuel Hoover, President; Wm. G. Henry, V. President; Wm. Silver, Cor. Secretary; Wm. Clift, Rec. Secretary; Jacob Thornburgh, Treasurer.

*Hancock County Society*—formed in June last—22 members.

Estimated products of the county:

Oats	10,000 bushels, worth 25 cts.	-	-	\$2,500
Corn	120,000 " " 37½	-	-	45,000
Wheat	3,000 " " 100	-	-	3,000
Turnips	4,000 " " 12½	-	-	500
Potatoes	5,000 " " 25	-	-	1,200
Hay	5000 tons " 7	-	-	35,000
Jeans, linsey, and other manufactured articles		-	-	22,500

Total 109,750

President, John Milroy; Cor. Secretary, A. F. Mayo.

*Hendricks County Society*.—Number of members 41. No fair has been held and but little done.

*Fall Creek Township Society*, Madison county.—But recently organized; number of members 30.

*Washington County Society*.—Organized with 40 members.—Held a fair on the 13th and 14th of November, which was well attended. Officers, Marston G. Clark, President; Nathan Trueblood, V. President; Ch. Harrison, Cor. Secretary; W. H. Carter, Rec. Secretary; B. Morris, Treasurer.

*Posey County Society* has published a determination to distribute in premiums from \$200 to \$300 a year.

Officers, R. D. Owen, Rec. Secretary; John Cooper, Treasurer.

## B

### PROCEEDINGS OF THE STATE AGRICULTURAL SOCIETY.

Agreeably to the provision of the "act for the encouragement of agriculture," the State Agricultural Society of Indiana convened in the Hall of the House of Representatives, Dec. 14, 1835.

The meeting was called to order by Mr. Blake, President of the State Board, and the list of societies being called over, the following gentlemen appeared, presented their credentials, and took their seats:

JAMES BLAKE,

M. M. HENKLE,

JOHN OVENS,

N. B. PALMER,

LARKIN SYMMES,

State Board.

Col D. L. McFARLAND, Marion County Agricultural Society.

CHRISTIAN C. NAVE, Hendricks County Agricultural Society.

WILLIAM H. BENNETT, Union County Agricultural Society.

DAVID NOBLE, Hancock County Agricultural Society.



WILLIAMSON DUNN, Jefferson County Agricultural Society.

Captain JOHN BUSBY, Fall Creek, Madison Co. Agricultural Society.

The following societies having failed to send up delegates, gentlemen present, from these societies, were invited to seats as honorary members of the society, viz:

Rush, Washington, Wayne, Tippecanoe, Putnam, Knox, Monroe, Henry, Franklin, and Rising Sun, Dearborn county.

M. M. Henkle, Secretary of the State Board, then read to the meeting the following report from that Board:

"Agreeably to the provisions of 'An Act for the encouragement of agriculture,' this is the period designated for a meeting of the friends of agriculture, representing the different sections of the state, for the purpose of "devising plans of operation, means for the diffusion of agricultural intelligence," and generally, to do whatever may be done in advancement of the grand object in which we have embarked. And though the Board are not required to make report to this meeting, but to the Legislature, yet, regarding this meeting as a grand council of agriculture, by the aid of whose united wisdom, the Board are to be the better prepared to make up their annual report to the Legislature, we can but regard it as our implied duty to present to this meeting, a brief report of our proceedings, prospects, and plans.

At this early period of our operations, under the late agricultural law, it is not to be expected that we should be prepared to present much in the nature of a history of what has been done in this cause, either by us, or by the societies but recently organized under the statute. This Board was not created until the latter part of April, and when organized, were wholly destitute of any means or resources for prosecuting a profitable correspondence, or of imparting information or advice, or of operating in any efficient manner upon the agricultural community of the State. They have, however, not been wholly inactive. Immediately after their organization, they prepared, printed, and circulated throughout the State, a circular, giving such advice and directions as they thought calculated to facilitate the formation and efficient and harmonious action of county agricultural societies. And they have been greatly gratified to observe the spirit and zeal with which the citizens of many of the counties have formed societies and carried forward their operations. In a considerable number of counties, agricultural fairs have been held; and in each particular instance they are represented as having excited the liveliest interest and produced the best effects.

In some counties, however, nothing has been done,—in others, societies have been formed, but have not persevered in the good work sufficiently to excite a suitable interest, or to produce any permanently beneficial results. The Board ask the aid and direction of this meeting in devising means which shall create a deeper and more universal interest in this matter than has heretofore existed.

The Board, on their organization, authorized the Secretary to open a correspondence with distinguished scientific agriculturalists in different parts, for the purpose of collecting intelligence which would be o

value to us in carrying on the work in which we have engaged. This has been done to some extent, and extracts have been read to the society; but it was not to be expected that persons serving on this Board without compensation, could incur much expense in carrying on a correspondence, however beneficial it could not have failed to be, if properly conducted.

The Board were early led to reflect upon the great importance of collecting an agricultural library, knowing the great scarcity of works of this sort in our new country; their immense value in exciting to effort, and in giving intelligent direction to that effort. And a subscription was prepared for receiving donations for this object. Little however, has as yet been done. Three of the members of the Board have contributed to that object, each ten dollars, and two gentlemen of Owen county have each contributed two dollars and fifty cents.

The Secretary has also received from Judge Buel, the enterprising President of the New York State Agricultural Society, and editor of the *Cultivator*, a complete file of his valuable periodical, as a donation to our library. Mr. Medary, editor of the *Ohio Farmer*, and Dr. Wallace, Editor of the *Farmer and Mechanic*, have each generously presented copies of their respective periodicals, for the same purpose.

The grand subjects, to which, in the opinion of the Board, we should look, (either presently or prospectively, according to our means,) for the accomplishment of our ulterior design, are, 1. The organization and keeping in active life, of county and township agricultural societies. 2. An agricultural library. 3. A periodical suited to our agricultural condition, and calculated for our meridian. 4. An experimental farm and gardens, through which to introduce to the notice of our farmers, the best varieties of animals, vegetables and products, and the best methods of cultivating, improving, and perfecting them. 5. A school in which agriculture shall be taught scientifically and practically, and by which this, the most ancient, honorable, and useful vocation, shall be elevated to that high ground it deserves to occupy, in science and literature, in respectability and usefulness.

The Board are by no means discouraged on account of the LITTLE that has as yet been done, but are rather encouraged by the promise and prosperity which have attended our incipient operation.

We have been more successful in our early experiment, than any state in the Union, so far as our knowledge extends.

Where fifteen or twenty years since, were the battle fields and hunting grounds of the red archer, we have witnessed the peaceful tumults of the agricultural fair,—the kindly rivalry of domestic and mechanic competition.

Ours must ever be an agricultural State—must be, almost exclusively so—may be, pre-eminently so; and already our recent wilderness begins to bloom as the rose, and our agricultural tree to spread itself abroad as the cedars of Lebanon.

Diligence, zeal and perseverance in this good cause, will make us the humble benefactors of our state, and of generations which shall come after us. On this field we may rear us monuments, more to be



valued than sculptured marble or ever-during brass—may win bloodless laurels, which shall bloom in living green over our unlettered tombs, when those of the sanguinary hero and titled oppressor of mankind shall have faded and withered, and their names cursed and forgotten.

JAMES BLAKE,  
JOHN OWENS  
LARKIN SIMMS,

M. M. HENKLE,  
N. B. PALMER,  
State Board.

*December 14th, 1835.*

After the reading of the report,

Richard W. Thompson, of the House of Representatives, offered the following resolution, which he supported in an eloquent address:

*Resolved*, That the report of the State Board be adopted and printed in the newspapers of this place; and that the Board be requested to continue their efforts for the promotion of the interests of agriculture in this state. The resolution was unanimously adopted.

C. B. Smith, Speaker of the House of Representatives, offered the following resolution, and in some pertinent and able remarks, supported its object:

*Resolved*, That a committee of two be appointed to inquire into the necessity, advantages, cost and probability of support, of a monthly agricultural periodical of not larger than super royal size, and report to the State Board.

C. Fletcher, proposed to amend the resolution by adding in its proper place, "or of inquiring into the practicability of engaging the proprietor of some weekly newspaper in this state to devote such paper the following year to agricultural science and intelligence." Mr. F. accompanied his amendment with some appropriate remarks on the general utility of agricultural papers, and the great and present necessity of such a work in our state, as an indispensable auxiliary to the general system of agricultural improvement lately commenced in Indiana. The amendment, and then the resolution as amended, was adopted.

Hon. J. L. Holman, Judge of the United States District Court, offered the following resolution, and in support of its object, made an able and very interesting address, as follows:

MR. PRESIDENT—

I shall not speak of the imporiance of agriculture. That which furnishes the provision of a world, needs no eulogy. Nor shall I speak of agriculture in regard to its susceptibility of improvement. This is no longer a questionable matter. The numerous improvements that have recently been made, in farming utensils, in cultivating the soil, and in the management of stock, have put this subject to rest. All that relates to producing, preserving and using the fruits of the earth, has been made the subject of philosophical investigation, and has elicited much important information, and many valuable discoveries. That to

which I would invite attention, is, the adoption of some method, to render all the improvements that have been made in agriculture, the common property of all our citizens: and I know of no method by which this could be more effectually done, than by the establishment of a school in which agriculture should be scientifically and practically taught; whereby a number of our youth might become thoroughly initiated in the knowledge and practice of all that is known upon this important subject; and in their turn become the instructors of others, in various parts of the state, until the knowledge and skill that is now possessed by a few, might be diffused throughout the community, so that every farmer might turn his labor to the very best account. Another material advantage would result from such an institution.—It would present to our citizens a farm stocked and cultivated in the most approved method. We may, according to the resolutions already adopted, publish the annual report of the State Board, and support an agricultural paper containing intelligence of much that has been done for the advancement of agriculture: all this is well, and its effects will be beneficial; but still the state of society demands something more. A full exemplification of the subject is needed, that our farmers may not only hear of the advantages resulting from superior modes of agriculture, but see them in all the realities of demonstration. I have long been a practical farmer, and feel a deep interest in all that conduces to agricultural improvement. It was nobly said, that “he who causes the earth to produce two stalks of grass where but one grew before, is a public benefactor. Mr. President, he who uttered that expression was himself a public benefactor. Whoever by word or deed gives a new or an additional impulse to our agricultural concerns, merits the thanks of his country. And I cannot but think that a well organized agricultural school, standing alone, or connected with some of our manual labor institutions would have a salutary effect in promoting a more general knowledge of scientific agriculture. I pretend to no superior knowledge on this subject, nor am I prepared to urge the immediate establishment of such an institution; but I deem it a subject that merits investigation, and wish to have it recommended to the State Board as one well worthy of their attention. Such a school would not only have a tendency to disseminate a correct knowledge of agricultural improvements, and rear up a more skillful class of farmers, but it would also stimulate inquiry and experiment, and might lead to further inventions and discoveries, in this universal concern. It cannot be supposed that art has put forth her utmost skill, in forming utensils to facilitate the labour of the farmer, or that all the principles of animal or vegetable life and growth, and productions, are fully developed. Nay we have but just passed the threshold of Nature’s great laboratory, and we may well believe that many long trains of profitable inventions and discoveries will succeed each other, before it can be said that the inventive powers of art are exhausted, or all the mysteries in Nature’s bosom unfolded.—Before it can be said that the earth has put forth all her strength and the soil exhibited its utmost productive-

ness. The circumstances under which we are likely to be placed hereafter, demand the utmost improvement in agriculture. Among other things the increasing population of the world will demand an increase of provision. But in order to see an enlarging demand for agricultural productions, we need scarcely look beyond the bounds of our own state. We have now the wants of 600,000 inhabitants to supply, besides supplying the wants of a large portion of our neighbors. But when we cast our eyes over the uninhabited parts of our state, what a vast blank do we discover, which is to be filled up by a future population, and I have no doubt the coming generation will see this blank filled up with millions. All these must be sustained, and that too while we furnish an increasing supply of provisions to the rapidly increasing numbers who are dependant on our productions. Thus we see that not only the ease and comfort of the farmer, but the increasing wants of the community demand the general exercise of every agricultural facility. Nor is there any thing to discourage the utmost effort in this matter. The state of society is highly favorable to agricultural improvement. The time was when we were almost compelled to pursue the same course that had been pursued by our predecessors.—When custom required that the son should use the same farming utensils as his father had used before him, and use them in the same way; when he who presented a new fashioned plough was considered as an innovator on the rights of farmers, and he who suggested that we were not farming in the best manner possible was considered as guilty of agricultural heresy. But the chain and the charm of custom are broken. Reason and experiment have obtained the supremacy, and improvement in every thing that relates to agriculture is not only cordially received, but earnestly invited, and hailed as the harbinger of better days for the agriculturist.

The time also was when men were so thoroughly fixed in their long accustomed employments, that any invention or discovery which would enable one man to perform the labor of many, was a presage of evil, if not of temporary ruin to thousands who would thereby be thrown out of their regular employments. But now, and especially in our happy country, if the powers of machinery were so increased that every man could perform the labor of a thousand, and the productiveness of the earth was increased a thousand fold, no man need be thrown out of employment—there would still be room for all, with an ample reward for their labors. Such is the vast demand for laborers in removing our extensive forests, erecting habitations, constructing our highways, rail roads, and canals, that could the earth bring forth its productions spontaneously to the utmost extent of our wishes, our present farmers would find immediate employment in other fields of productive and well rewarded labor. Every thing therefore, that increases the productiveness of agricultural labor, merits the encouragement and co-operation of all. I then move the adoption of the resolution."

*Resolved*, That the State Board be instructed to inquire into the propriety of memorializing the Legislature on the subject of establishing a school in which the science and practice of agriculture shall be taught,



and of connecting the same with some of our schools and colleges, and that they embody the result of their inquiries in their annual report, or lay the subject before the Legislature, as they may deem expedient.

To which, on motion of John Dumont, of the Senate, the following amendment was appended, and thus amended, was adopted.

"And that they inquire whether it is probable that the Beaver could be so far domesticated as to be profitable to those who should embark in such undertaking."

Mr. Dumont read an article of considerable length and interest in support of his amendment.

Mr. Henkle read an interesting letter from Hon. Jesse Buel, of Albany, N. Y. on the subject of agricultural schools.

David Macy, of the House of Representatives, offered the following resolution, which was adopted:

*Resolved*, That in the opinion of this meeting, it is highly important to the agricultural interests of this state, to have, at the seat of government, an agricultural library, for the use and benefit of agriculturists generally, and for the delegates of county societies, and the State Board especially; and that the State Board be instructed to ask the Legislature to appropriate a sum not less than fifty dollars, to be applied under the direction of the Board, to the purchase of suitable works of agriculture.

On motion of Col. D. L. McFarland, the following resolution was adopted:

*Resolved*, That the members of the State Agricultural Society be requested to appear in domestic apparel, at their next annual meeting:

The following resolutions were offered by Mr. Fletcher:

*Resolved*, That a committee of two members of the State Board be appointed to prepare a memorial to the present General Assembly, requesting that the "Act for the encouragement of agriculture," be so amended as to make it the duty of the several Boards doing county business, to appoint one of the three nominees who may be annually presented by the agricultural societies of the respective counties, as the delegates to the State Society; and should there not be an agricultural society in any county, the board doing county business in such county, shall appoint a suitable individual as such delegate, making such compensation for his time and services, as may be deemed proper.

*Resolved*, That in order to perpetuate the history of the progress of agricultural science and practice in Indiana,—to afford proper information to the State Society in its operations, and to connect this great interest with the policy of the State, that they farther ask an amendment of said act, so that each Board doing county business, obtain from their respective agricultural societies, or otherwise, and record upon the books of the Board, an annual statistical account of the growth of staple articles of husbandry, and manufactures, in each county.

After some discussion, in which Mr. Fletcher, Col. Berkshire, Judge Dunn and Mr. Kilgore, of the House of Representatives, took part, the resolutions were adopted.

On motion of Mr. Henkle, it was



**Resolved,** That a committee of two be appointed to enquire into the best means and probable advantages of introducing into our State, improved breeds of cattle and other domestic animals, and report to the State Board.

John Owen and Nicholas McCarty were appointed said committee. On motion of Mr. Fletcher, it was

**Resolved,** That a committee be appointed to inquire into the propriety of encouraging the growth and manufacture of silk in this State, and report to the next annual meeting, or to the State Board.

**Resolved,** That a committee of two be appointed to ascertain the quantity of cotton and tobacco raised in this State, and whether our climate, soil, and prospects of a market will justify a competition with other states in the growing of both, or either of those articles, and make report to the next annual meeting.

The society then adjourned *sine die*.

JAMES BLAKE, *President*.

M. M. HENKLE, *Secretary*.

## C

### REPORT ON THE CULTURE OF SILK.

#### TO THE INDIANA STATE BOARD OF AGRICULTURE—

The Committee appointed by the State Society to inquire into the expediency of encouraging the culture of Silk, in this State, have given that subject the consideration the short period allowed them would admit of, and now submit to you the following very brief Report:

Your Committee are clearly of opinion, that there is nothing in the nature of our climate to prevent the introduction of Silk culture into Indiana, because it is found to flourish in both higher and lower latitudes than those of our State; and because the few and limited experiments which have been made in that culture, have been entirely successful, so far as success depended on climate.

In preparing for this branch of culture, the first object to be considered is the necessary food for the silk worm. This is the leaf of the Mulberry tree. In some of the small experiments made in this State, the worm has been fed on the leaf of the common native Mulberry of our forests; but though the worm will live on this food, and spin its *fbre*, yet the article is much too rough and coarse to be valuable. The appropriate food of the Silk worm is afforded by the White Italian Mulberry (*Mores Alba*), and the new Chinese Mulberry (*Mores Multicaulis*). The latter of these we regard as preferable; 1. Because it is remarkably easy of propagation and growth. 2. Because the quantity and quality of food afforded by it are greater and better than from any other tree known. This tree has been supposed to be too tender for the rigor of our winters, but it is found to flourish as far north as New England, and in many places is entirely superceding the Italian. And in

the possession of one of your committee there is now a plant of the *Multicaulis*, which grew the first summer in a state east of the mountains, the second in Ohio, and the past one in Indianapolis; with equal readiness vegetating in each new location.

The third season from the sowing the young plants will yield a considerable amount of food for the silk worm, and then operations may be commenced; but the leaves will not be in very great abundance before the fifth year. It is estimated that an acre hedged and planted with Mulberry, will yield a profit as follows:

From 5th to 10th year 20 per cent.; from 10th to 15th year 47 per cent.; from 15th to 20th 112 per cent.

Mr. Fitch who is cited as authority by the Secretary of the Treasury, estimates the average product of an acre of Mulberry orchard, per annum, at \$160. Mr. Storrs at \$240. Mr. Permentier estimates the average profits of an acre for the first 20 years, at \$205 per year, and \$490 afterwards.

It should be borne in mind, that after the food is prepared the labor required to produce the profits quoted is but small; that it extends only through five or six weeks in a year, and that the whole can be performed by children, aged persons, &c. That is, to produce the silk in the *cocoon* or ball. And that is the form in which we should calculate to sell the silk made in this country for many years to come: For 1. The winding it, in a proper manner, is an operation only to be well performed by those who have had instruction and experience, while the feeding of the worms, &c., to produce the cocoon, is so perfectly simple as to be performed by any child. And 2. A market for the article in the form of cocoons will always be readily had, and at fair prices; those who have filatures, throwsting machinery, &c., relying on the producers of the raw material.

But the question naturally presents itself "will the demand and the price continue, should the culture become common or general in our country? We answer yes. For the foreign demand for the raw silk is immense. In 1831 England imported from other countries, for the supply of her silk factories 3,865,146 lbs. of raw silk, which at \$4 per pound would amount to \$15,450,584.

Again, the subject of silk culture is now exciting very general attention throughout our country. Congress has several times acted on the subject for the purpose of giving it suitable encouragement. Some of the states have made liberal appropriations to diffuse proper knowledge and interest on this subject. Companies with large capital have been incorporated to produce it. Three periodicals in our country are devoted to the subject, and new works are continually coming forth to give new light and greater interest to this matter. The result must be that not only the production of the raw material, but the manufacture of silk fabrics will become an important branch of industry and source of profit in our country. Then, not only shall we have the market created by the immense foreign demand, but the market created by the demand of our manufactories; which must be very heavy, as we

now yearly import silk fabrics from other countries for our own consumption to the amount of from 10,000,000 to 12,000,000 dollars.

In different parts of the United States companies have been organized and incorporated for the culture and manufacture of silk with capitals of \$50,000 and \$100,000, which will greatly contribute both to the more extensive introduction of the silk culture, add to the creation of a good and permanent market for the cocoons which may be produced in the west, while there are no manufactories in this portion of the states.

The committee, upon the whole, are convinced that the culture of silk may be very advantageously prosecuted in Indiana; and that an experiment which shall prove the practicability and advantages of it, should be made as early as possible. We therefore take leave to suggest to the Board the propriety of an application to the legislature, for the use of a portion of the grounds at Indianapolis belonging to the State, and for a small appropriation to be expended in rearing Mulberry trees on said grounds. Should such an application be made, and be successful, it might be an eligible plan to appropriate a few acres, say one of the reserved squares, as a Mulberry nursery, from which scions might be supplied to the different agriculture societies throughout the state gratuitously, so to facilitate the introduction of this interesting branch of profitable culture among us.

Your committee would also recommend to the Board an application to the legislature for the passage of an act exempting all silk growing and manufacturing establishments in the State from taxation for ten years; and the granting of a premium of, say six per cent. advalorem on all cocoons grown, and silk fabrics manufactured within the State for a like period. This measure would only be following the example of some of the eastern states, who have found such measures of encouragement decidedly advantageous to the interests of the State.

All which is respectfully submitted,

M. M. HENKLE,  
SHEPHERD WHITMAN, } Com't.

*Indianapolis, January 20, 1836.*

## D

### REPORT OF THE STATE BOARD OF AGRICULTURE, ON AGRICULTURAL SCHOOL.

By a resolution of the State Agricultural Society, it is made the duty of the Board to make inquiry, and report to your honorable body on the subject of an agricultural school; in obedience to which, we submit the following:

In all the range of official duty devolved on the Board, either by the



statute or the state society, there is no one of more deep and universal importance than the one under consideration.

Hitherto, agriculture has very generally been regarded in the light of a mere manual operation, more simple than any other art, science, calling or profession, and in which, consequently, it has been supposed, that less of mental operation is required, than in any other department. Indeed, the common impression seems to be, that any one, without either previous reading, study or practice, may at once enter upon the duties and reap the profits of a first-rate agriculturist. This view of the matter, is as mischievous in its consequences, as it is erroneous in itself.

1. In proportion as the agriculturist regards his vocation as merely physical, and requiring no exercise of mental power, or scientific attainment, in the same proportion will his vocation become degraded in his own estimate of it; and in a similar ratio will he cease to respect himself in that vocation. For the same doctrine that teaches him that *farming* requires less mind and intelligence than any other of the trades, callings, or professions, teaches him to regard the *farmer* as less respectable in his calling than any of these. From this want of *professional respect*, if we may so denominate it, and which we actually see very extensively prevailing among our farmers, results this additional evil, that seeing the farmer rate himself inferior to all others, *they* are led to regard him in that light of inferiority in which he has placed himself. Hence, we find farmers, and others, seeking to place their sons in more respectable employments, by foisting them into some overcrowded and unprofitable profession, or even into the place of some inferior shop-tender—or any thing, rather than the vocation upon which all others depend for subsistence.

2 Another of the evil effects of this error, is, that while animal power only, is supposed necessary in prosecuting agricultural operations, *that* only will be employed. There will be no research, no enquiry put forth, no scientific experiments, no improvement, and consequently little or no profit. The bounteous earth, under the blessing of Heaven, will to some extent yield her fruits even under the rude culture of ignorant husbandry, but there will be comparatively but little profit.

3. Again; under the view stated above, the husbandman submits to till the earth rather as the hard condition of procuring subsistence, or as the heavy infliction of the primeval curse, than as a matter of choice or a source of pleasure. Not so the enlightened agriculturist: His farm is his earthly paradise; where all the animal, vegetable, and mineral kingdoms concentrated, invite research and investigation, and promote enjoyment.

The rational remedy for the evils spoken of, is to enlighten suitably the agricultural community—raise their standard of intelligence, and thereby, that of their respectability, usefulness, and enjoyment.

Convinced of the necessity of this measure, thousands of individual attempts have been made, aiming at this end; thousands of farmers have redoubled their own labors, to enable them to educate their sons.



They have been sent to the best schools in the country; but though they have, (it may be) graduated with credit, and have come forth classical scholars, the first idea has not been imparted to their minds, calculated to raise in their estimation the vocation of agriculture. The whole current of their education has set in an opposite direction, and less now than ever, could they consent to bow their classic minds to the grovelling employments of the husbandman; and as matter of course, they aim at some one of the *learned professions*.

In these cases, the desired object is not attained; not indeed for want of education, but for want of an education of a proper kind—one suited to the object proposed. And you might as reasonably hope to make your son a finished Greek scholar, by apprenticing him to a blacksmith, as to teach him the love, the science, or the practice of agriculture, by an ordinary academical course of education. It is not a classical education that is needed to accomplish the particular object, but what may be styled a *professional education*.

There are certain great elementary principles of general education, which the agriculturist, in common with all others, will need, and which may be obtained in any institution of learning. But if your son is destined for any particular profession, or to be an artist, or even a common mechanic, he must receive a professional education or training, to qualify him for his destined sphere. And in all these, the requisite facilities are afforded him readily. We have medical schools, law schools, theological schools, music schools, schools for teaching the fine arts: and in these the candidate is taught a knowledge of the principles and practice of his intended profession. And even in the ordinary mechanical callings, though there is a lamentable deficiency in teaching the scientific elements of those vocations; yet even in these, where habit and practice are made to supercede the science which belongs to these departments, a long course of *manual instruction* is universally deemed necessary to qualify the mechanic for his intended employment. But though no other profession or vocation embraces so wide a range of science in its nature and bearings, yet it is most singular, that there is not, as we believe, in the whole world, what can be in strict propriety, called an agricultural school!

This remarkable deficiency has of late years been seen, and felt, and deplored most deeply, by many of the best friends of agriculture; and a laudable attempt has been made to reach and remedy the evil by the institution of manual labor schools. These have been very beneficial, doubtless, and have aided many of the indigent youth of our country to obtain an education. But they have not essentially touched the case in question. True, the student is required to labor at some mechanical or agricultural employment, a portion of his time, by way of economizing in his expenses of education, and for the promotion of his health; yet this labor is a mere *penance* to which he submits as the means of obtaining an education. No one goes there to study agricultural science as a primary object, for indeed this is not regarded as any part of his education, but as a means of obtaining it. Nor is it attempted to teach the sciences connected with agriculture in the schools; be-

cause as already remarked, this does not make a part of the student's education.

Now, that which is wanting to secure the respectability, usefulness, and happiness of the agricultural community, is a school in which the science and practice of agriculture shall be taught *professionally*. Not to *use* (rather than teach) the practice without its science, and use it only as a *foot-block* by which the student hopes to reach the *sanctum sanctorum* of Greek and Latin classics. No: agriculture must be taught as a proud, independant, and enobling science. Then it becomes the *neplus ultra* of the young man's ambition. He finds it an extensive, delightful, diversified and useful science; and will be more justly proud of having graduated with honor in a respectable school of agriculture, than to have borne away the palm for having acquired more of the comparatively profitless lumber of ancient classic lore than his fellows or classmates.

But the inquiry very naturally arises, what is there to be taught in a school of the kind proposed? Are not all the sciences taught in our schools and colleges? We answer that several sciences having essential connection with agriculture, cannot be said in justice to be *taught* at all; in our western schools especially. And others which are taught, are not taught in their connection with, or bearings on agriculture. It is one thing to study the abstract elements and principles of a science, and a very different thing to learn its connection with some particular vocation of life, and if we may so speak, to *domesticate* it, and render it subservient to the comfort and happiness of man.

For example, you may take your regular college course in mathematics, you may study your *conics* and *spherics* and *fluxions* most profoundly, and yet be unable to survey accurately a *quarter section of land*, or do the civil engineering for a common *mill race*.

Chemistry has been long known, and learnedly studied and taught, but its extensive connection with agricultural science and operations, and its immense value in this connection, were but little known till the time of Sir Humphrey Davy.

Botany, as it stands related to agriculture; Geology, by which we learn the qualities of the earth we cultivate; Agricultural Chemistry; the principles of animal and vegetable life,—their anatomy or structure, functions and diseases: these, with what may be called the *practical theories*, drawn from a thousand experiments, teaching the propagation, culture, improvement, and preservation of animals, fruits, plants and other products; and these all tested and demonstrated by a well regulated course of practical experiments, would constitute the general outline of a course of *professional instruction* in agriculture. And these would embrace a scope sufficiently extended and learned, for the most grasping intellect, yet sufficiently simple and practical for the most ordinary capacity, and the most active disposition.

The Board are instructed to inquire, not only into the expediency of establishing an agricultural school, but also, of connecting it with some one of our seminaries or colleges.

We are decidedly of opinion, that such a branch of education, would

not advantageously connect with an institution of directly opposite character and objects. And in this light we must regard most or all existing institutions in the State. The paramount object of all seems to be, not to make the students scientific and useful *operatives*, but to prepare them for what are styled the learned professions.

And we have knowledge of but one institution in contemplation, with which such an one as we propose, would kindly assimilate. That one proposes, that manual labor shall be embraced in the plan of the school, but that all labor shall be taught to the student scientifically as a part of his education. With such a school, ours would readily enough combine; but the one in question is not yet in organized existence, and we cannot therefore, act with present reference to it.

At this first introduction of the subject, we do not feel called upon to attempt a detailed estimate of the cost of creating and sustaining such an institution, nor to present all the *minutia* of its plan. This is, we believe, the first movement, save one, of this kind, that has ever been made, and we can hardly hope for the immediate success of our plan, and the consummation of our wishes. A few general suggestions, however, may not be unappropriate in this place.

The Board have been led to reflect upon the necessity of establishing an experimental farm, as an important item in our general system of agricultural improvement. Such an establishment would be of great value, in introducing new or improved varieties of animals, products, and methods of culture and management. Such have been established in some places, by organized companies, for the double object of public good and private gain. And such an establishment we regard as an indispensable appendage to an agricultural school, or rather, a constituent part of it. For, a school so constituted as to answer the purposes contemplated, must be one of practical and experimental, as well as of theoretic and scientific agriculture.

Combining these elements in an institution, the school-farm, and gardens, would easily be made to yield all the requisite supply of provisions for the concern; and if located contiguously to a good market, would, in the profits of its surplus produce, contribute to support the institution in other departments of its expenditures.

Indeed, it is reasonably calculated, that apart from the expense of purchasing and stocking the farm, erecting the necessary buildings, and other preparatory expenditures, the institution would soon rise above its current expenses, and by its own income, gradually diminish its original debt of erection.

The Fellenburgh school at Hofwyl, in Switzerland, is perhaps the nearest approach to a purely agricultural school. In this institution, the model and experimental farm, supplies the wants of all those connected with it—about 300 in number, many of whom can contribute little or nothing to their own support.

That such an institution once established on a proper footing, would be liberally patronized, especially by the intelligent farmers of this State, cannot for a moment be doubted. Indeed, we are sure that many members of your honorable body, would rejoice in an opportunity



of educating their sons in a school of this character; one from which they should return home, stored with useful knowledge and agricultural science, and imbued with a love, and practical acquaintance with the peaceful and virtuous employments of husbandry.

In an experiment a few years since made, of what was called an agricultural school, though essentially defective in its plan, so great an anxiety was shown by the farmers to give their sons an agricultural education, that though the school could only receive some 50 or 60 students, in a short period applications were made for the admission of about *ten times* the number, or about 500, who had of necessity to be rejected.

Could the Legislature of Indiana then, render a more valuable service to her sons, than by appropriating a small portion of the means in her control, for educational purposes, to the object, in question?

It will be a proud day for Indiana, when she shall resolve, though young, to lead off in this noble enterprize! No measure, in our opinion, requiring the same amount of expenditure, would equally promote our character abroad, or our prosperity at home. Already our agricultural movements have attracted attention abroad; and let us but be first to erect an agricultural school, and the sons of many distinguished men of other states, and especially those of the enlightened agriculturists of our country, would immediately be placed under our care and instruction. Several very eminent men in different states, have written to the Board, expressive of a strong wish and high expectation, that Indiana would take a distinguished lead in this noble design.

Such an institution should evidently be a state work, and its benefits should flow with an equal stream to all portions of the state; but we are strongly inclined to believe, that should such a measure on the part of the state be deemed expedient, if a charter were granted to a company for such a purpose, in which the state should become a stockholder to a reasonable amount, the residue of the stock could be, without much difficulty, disposed of to individuals, or associations.

In conclusion, we would only remind you, that should any action on the subject be contemplated, which would require more particular information, detailed estimates &c., it is the statutory right of your honorable body to command the services of the Board at all times.

All of which is most respectfully submitted,

In behalf of the Indiana State Board of Agriculture.

M. M. HENKLE, *Secretary.*









H. R.

REPORT

OF

THE CANAL COMMISSIONERS.

FEBRUARY 2, 1836.

Read and ordered to be printed.

*To the General Assembly of the State of Indiana:*

The undersigned respectfully proceed to exhibit the sales of Canal lands, and a statement of the moneys received by them, and disbursements made during their financial year, commencing December 1st, 1834, and ending November 30th, 1835.

They have sold from Nov. 25th, 1834, to Nov. 25th, 1835, 93 16-100 acres of the canal lands for the sum of \$188,374 11, of w amount there was received in cash as part payment of the purchase money the sum of \$ 49,004

For interest one year in advance on the same, 8,361

For full payments made for lands sold previous to November 25, 1834, 7,778

For interest on lands sold prior to Nov. 25, 1834, 8,897

\$ 74,042

They have drawn drafts and orders on the Commissioners of the Canal Fund, and received from them, the sum of \$ 77,211

There was, Dec. 1st, 1834, to meet current expenses, as per last report, in the hands of D. Burr \$12,790 10

In the hands of Sam'l Lewis 1,566 57

In the hands of Ja's B. Johnson, 15,880 10



Also the evidence of the debt of John Scott, late Canal Commissioner

451 75

Making a total for which they are chargeable for the year's operations of

\$406,976 89

### THEY HAVE PAID

To canal contractors for work on the W. & E. Canal, the sum of

\$319,119 68

For the surveys of the Jeffersonville Canal route, of the random routes, and the Central Canal route, including the salaries of Wm. Gooding and F. Cleaveland, at \$1400 each, and all other expenses chargeable to the location of the Central Canal, the sum of

10,630 62

For the location of the W. & E. Canal from Lafayette to Terre-Haute, and thence to the Central Canal near the mouth of Eel river, including the salary of C. T. Whippo, Engineer, and other expenses, the sum of

4,487 56

For superintendence of the W. & E. Canal, including pay of Engineers, pay of two Canal Commissioners, and the cost of the location of the Canal route from Fort Wayne to the Ohio state line,

14,584 75

For damages for right of way for Canal, pay for Commissioners assessing same and pay of jury, sheriff, &c.

1,301 38

For lands for mill privileges

600 00

For expense of selling lands, including pay of one Canal Commissioner,

961 00

They have paid over to the Commissioners of the Canal Fund, as per receipts of Nov. 30, 1835,

34,926 61

They have handed to the attorney to commence suit on the part of the state, the evidence of the debt of John Scott, late Canal Commissioner, of

451 75

There was left in the hands of Jas B. Johnson on the 1st Dec. 1835, to meet the Dec. payments on the Canal line, the sum of

19,913 54

\$406,976 89

The accounts of these receipts and disbursements in detail with the vouchers for each item are reported to and filed with the Auditor of Public Accounts, and with the Commissioners of the Canal Fund, and of course are open for the inspection and investigation of the proper committee. All of which is respectfully submitted.

D. BURR,

SAM'L LEWIS,

JAS. B. JOHNSON,

} Commissioners

of

} W. & E. Canal.

Indianapolis, Jan. 19, 1836.

Masonry in Lock per perch of 16½ c. feet.	4	75							
Excavation to widen.	4	50							
Excavation on opposite side river.	4	50							
Embankment around abutments.	4	30							
Masonry in abutments.	20	5	25						
Excavation of Dam or Abutment piers per cubic yard.	15								
Bearing piles driven and cut off per pile.	15								
Iron worked into screw-bolts, spikes, etc., for Lock, Aqueducts, Dams or Culverts, per lb.	20								
Road Bridge complete.	22								
Lock Gates and mitre Sills, complete.	16								
Stone protection Bluffs or abutment Locks Dams, etc. per perch of 16½ cubic feet.	15								
Stone filling in Dam or Lock cribs, per perch of 16½ cubic feet.	60	500	200						
Dry wall for combined Lock, per perch of 16½ cubic feet.	62	600							
Culvert Masonry, per perch of 16½ cubic feet.	80								
	00								

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D. BURR,

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JAS. B. JOHNSON,

} Commissioners

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} W. & E. Canal.

Indianapolis, Jan. 19, 1836.









25  
H. R.

## REPORT

OF THE

## COMMITTEE OF WAYS AND MEANS.

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Mr. SPEAKER—

The Committee of Ways and Means, in the discharge of the duties imposed, have directed me to report,

That they have examined the books, vouchers, cash on hand, and the general condition of the offices of Auditor and Treasurer of State.

In making this examination the Committee are pleased in being able to state that the books and papers are in a condition manifesting strict economy, and the business transacted in either of the offices has been done in a neat and correct manner.

The following abstracts numbered 1, 2, 3 4 and 5, present a detailed view of the public finances.

Abstract No. 1, contains a statement of the assessment, collection, and payment into the Treasury for the year 1835, by which it appears that the nett amount for the Treasury was \$50,244 03. That the actual payments into the Treasury up to the 1st of January, 1836, were \$49,009 66; which leaves an outstanding balance for the above year of \$1,234 37.

No. 2 contains the receipts and expenditures during the year 1835, commencing January 1st, 1835 and ending 1st January 1836, by which it appears that the cash in Treasury on the 1st of January, 1836, was \$52,678 50.

No. 3 exhibits the balances due the State from Collectors of former years.

No. 4 exhibits the available means of the Treasury for the year 1836.

No. 5 contains an estimate of the expenditures for the year 1836, and the public debt.

The Committee are aware that the expenditures for the next must exceed that of the past year by a considerable sum, growing out of the increased representation, and the increased contingent expenses incident to their legislation:—Yet they are of opinion that the present rev-

enue law will bring into the treasury a nett revenue of not less than \$75,000 00, and in all probability, will be swelled to a sum over \$80,000 00. The lesser of these amounts will be amply adequate to the wants of the Treasury proper.

GEO. P. R. WILSON,  
*Chairman.*

# ABSTRACT No. 1.

No.	Counties.	Unlisted Lands and Polls.	Delinquents of former years.	Assessment with the fore- going.	Delinquents.	Commission.	County orders.	Mileage.	Nett amount.	Cash received.	Balance due.
1	Allen	\$ 9 61	\$ 6 00	\$ 457 60	\$ 111 37	\$ 31 16		\$ 6 72	\$ 308 35	\$ 308 35	\$
2	Boone	18 26	1 92	375 69	38 29	30 36		1 56	305 48	305 48	
3	Bartholomew	40 12	63 75	962 57	86 88	78 80		2 52	794 31	794 31	
4	Clark			1,720 43	185 57	138 13		7 00	1,389 73	1,389 73	
5	Clay			266 95	27 10	21 58		3 90	214 37	214 37	
6	Crawford	1 28		315 40	20 15	26 57		7 00	260 88	260 88	
7	Carroll	30 47		636 66	71 68	50 84		4 20	509 94	509 94	
8	Cass			373 38	82 72	26 15		4 20	260 31	260 31	
9	Clinton	7 50		669 38	69 99	53 94		3 06	542 39	542 39	
10	Dearborn	16 07		1,781 19	128 08	148 78		5 40	1,498 93	1,498 93	
11	Decatur	6 71		1,083 18	101 10	88 38	1 92	3 00	888 78	888 78	
12	Daviess								418 00	418 00	
13	Dubois	10 92		257 55		23 17		7 70	226 68	226 68	
14	Delaware	38 19	31 57	412 36	33 37	34 10		3 36	341 53	341 46	
15	Elkhart	44 34		395 96	29 54	32 97		9 36	324 09	324 09	
16	Fayette	10 13	38 50	1,428 29	180 25	112 32	14 60	3 36	1,117 76	1,117 76	
17	Floyd	18 24		327 30	165 65	59 54		7 26	594 85	594 85	
18	Franklin	32 20		1,447 84	126 16	118 95		4 20	1,198 53	1,198 53	
19	Fountain	96 32	13 37	1,319 83	121 20	107 87		4 50	1,086 26	1,086 26	
20	Gibson	22 62		942 24	22 95	82 73		9 60	826 96	826 96	



21 Green	2 82	3 54	542 37	73 95	42 15	1 32	4 44	420 51	420 51
22 Grant		7 82	192 36	12 00	16 23		4 76	159 37	159 37
23 Hamilton	6 06		559 04	53 33	45 51		1 32	458 88	458 88
24 Harrison	40 08	7 87	1,397 20	90 38	117 61	26 33	8 00	1,154 88	1,154 88
25 Hendricks	16 46		923 64	57 41	77 96		1 20	787 07	787 07
26 Henry	22 75		1,300 92	34 75	113 95	36 00	3 30	1,112 92	1,112 92
29 Hancock			467 22	44 45	38 04		1 20	383 53	383 53
28 Huntington		28 78	90 32					90 32	90 32
29 Jackson	22 21		895 97	75 98	73 79		4 38	741 82	741 82
30 Jefferson	18 68		1,571 07	222 67	121 35	1 94	5 04	1,220 07	1,220 07
31 Jennings			663 40	27 62	57 22		3 90	574 66	574 66
32 Johnson			924 92	34 66	80 12		1 20	808 94	808 94
33 Knox	57 07		1,177 03	49 76	101 45	2 87	9 00	1,013 95	1,013 95
44 Lawrence	24 89	4 95	1,255 30	66 56	106 95	10 04	11 62	1,060 10	1,060 10
35 Lagrange	6 74		132 37	9 75	11 03		10 32	101 27	101 27
36 Laporte	25 42		892 62	128 00	68 81		8 70	687 11	687 11
37 Madison	10 15		496 96	31 32	41 91		2 70	421 03	421 03
38 Marion	22 22		1,744 91	196 70	139 33			1,408 88	1,408 88
39 Monroe	3 51		847 39	56 80	71 15	1 94	3 12	714 38	714 38
40 Montgomery	12 63	29 25	1,856 74	125 42	155 81	36 48	2 64	1,536 39	1,536 39
41 Morgan	48 90		903 70	35 79	78 11	4 50	1 80	783 50	783 50
42 Miami	7 50		202 35	104 17	8 83		5 28	84 07	84 07
43 Martin	5 85		268 06	25 36	21 84		6 00	214 86	214 86
44 Orange	69 84		910 46	35 27	78 76		6 00	790 43	790 43
45 Owen	6 15	2 08	596 75	26 65	51 30		3 18	515 62	515 62
46 Parke	68 84	31 26	1,439 60	113 41	119 35	10 89	4 50	1,185 42	1,185 42
47 Perry	9 31		394 05	13 87	34 21		9 36	336 61	336 61
48 Posey	48 09		1,053 10	66 96	88 75		11 40	885 99	885 99

49	Putnam	27 73	1,443 12	84 06	122 31		2 52	1,234 23	1,234 23
50	Pike	6 75	3 37	25 75	33 75		8 10	333 19	333 19
51	Randolph	5 25		80 03	52 74		4 80	528 52	528 52
52	Ripley	4 34		99 19	67 66	64	4 32	679 19	679 19
53	Rush	57 80		82 06	176 88	9 96	2 52	1,776 05	1,776 05
54	Scott	5 36		46 25	42 54	1 50	6 00	422 63	422 63
55	Shelby	27 79		132 50	107 84		1 56	1,038 84	1,038 84
56	Spencer	16 69		85 04	48 61		9 24	437 88	437 88
57	Switzerland		19 80	87 19	105 23		6 00	1,038 24	1,038 24
58	Sullivan	19 55	2 62	45 38	67 20		7 20	672 36	672 36
59	St. Joseph	10 97		162 55	46 28		8 10	459 90	459 90
60	Tippacanoe	104 85		213 00	129 78		3 60	1,308 64	1,308 64
61	Union	14 46	18 00	52 50	90 20	7 07	4 20	900 78	900 78
62	Vanderburgh	2 48		58 40	36 13		11 10	354 25	354 25
63	Vermillion *	15 52		108 01	69 92		5 40	701 65	701 65
64	Vigo *	79 50		1,266 20				1,266 20	1,266 20
65	Warrick		48	16 69	39 57	37	9 60	390 20	390 20
66	Washington	18 51		10 46	141 66	25 83	6 00	1,400 62	1,400 62
67	Wayne	65 82		155 16	211 53		3 78	2,135 02	2,135 02
68	Warren	70 37	26 63	86 56	61 43		4 80	616 41	616 41
69	White			6 00	6 44		4 98	60 22	60 22
70	Wabash	54 50		20 31	10 17		6 60	96 30	96 30
Total amount		1,582 95	476 06	5,028 16	4,895 76	200 20	353 48	50,244 03	49,009 66

\* Paid since the first day of January, 1836.

# STATEMENT No. 2.—Receipts and Expenditures during the year 1835.

## RECEIPTS.

Amount reported in Treasury on January 1st,					
1835, provided all warrants audited were paid					\$46,278 98
On account of collection of Revenue for 1831					7 10
"	"	"	"	1832	77 76
"	"	"	"	1833	101 35
"	"	"	"	1834	366 01
"	"	"	"	1835	48,709 66
"	"	"	"	1827	145 79
					<hr/>
					49,407 67
From Rents of State Prison					700 00
"	Sale of Michigan Road Lands				31,666 40
"	Lots at Indianapolis				9,672 27
"	Indianapolis Loans (refunded)				16,740 11
"	Interest on Indianapolis Loans				2,200 90
					<hr/>
					60,987 68
"	Estate without heirs				33 53
"	Monies refunded				10 00
"	Congressional township				550 00
					<hr/>
					593 53
"	Sales of Seminary Lands				4,671 66
"	Loans refunded				8,880 87
"	Interest on loans of Seminary fund				2,763 12
"	Sale of mortgaged Lands				500 00
					<hr/>
					16,815 65
"	Sale of Saline Lands				3,514 30
"	Loans refunded of Saline funds				650 00
"	Rents Salt Lick Reserves				270 12
"	Conscientious Fines				33 00
"	Interest on loans of Saline funds				854 37
					<hr/>
					5,321 79
					<hr/>
Making amount of receipts, &c.					179,405 30
Received 1835					300 00
					<hr/>
					179,705 30
					127,198 30
					<hr/>
					52,507 00

## EXPENDITURES.

For Legislature, pay of members, &c.	19,048 34	
“ Public Printing and Stationary	5,367 82	
“ Specific appropriations	2,666 64	
“ Contingent expenses	787 08	
“ Wolf Scalps	529 00	
“ Probate Judges	2,962 50	
	<hr/>	31,301 38
“ Executive	2,300 00	
“ Judiciary	7,676 27	
“ Prosecuting Attorneys	1,384 50	
“ Militia	124 60	
“ State House	27,078 24	
“ State Prison	3,075 92	
“ State Library	200 00	
	<hr/>	41,839 53
“ Seat of Government	180 74	
“ Loans of Indianapolis fund	2,908 35	
“ Michigan Road	31,693 77	
“ Treasury Notes burnt	27 00	
“ Conscientious fines distributed	9 00	
	<hr/>	34,818 86
“ State College	2,422 55	
“ Loans of College fund	11,692 50	
“ “ Saline fund	5,010 00	
“ Expenses of Saline fund	83 43	
“ Rents of Salt Springs	30 00	
	<hr/>	19,238 53
		<hr/>
		127,198 30
Cash in Treasury provided all claims audited have been paid		52,507 00
To which add the difference between \$179 out last, and paid this, and \$350 50 out this year, which is		171 50
		<hr/>
The true amount of cash in Treasury on 1st January, 1836, is		<u>\$52,678 50</u>

M. MORRIS, Auditor.

Note.—Warrant out \$350—No. 1517.



STATEMENT No. 3.—List of balances due the State from Collectors.

Counties.	1822	1823	1824	1825	1826	1827	1828	1831	1833	1834	1835	Cts
Allen					27 43							27 43
Clark		565 06										565 06
Clay					9 45				89 01			98 46
Decatur							208 48					203 48
Floyd	184 59	733 84										918 43
Huntington										45 00	90 32	135 32
Jackson	224 99					84 03						309 02
Jefferson		33 74		70 18								103 92
Madison						50 89						50 89
Martin	203 92	217 19										421 11
Pike								65 75				65 75
Posey									27 87			27 87
Scott			104 52		293 05	270 33	306 00					973 70
Shelby				54 10								54 10
Switzerland						303 83						303 83

STATEMENT No. 4—Showing the available means of the Treasury for 1836.

The amount in the Treasury on the 1st day of January, 1836, was	\$52,678
There will probably be paid into the Treasury on account of arrears of revenue of 1835, and previous years	2,000
Rents of State Prison	700
It is estimated that there will be realized from sale of lots at Indianapolis	5,000
	<u>\$60,378</u>

STATEMENT No. 5—Being an estimate of the Expenditures for the year 1836, and the Public Debt.

Payments of members and officers of present session of General Assembly and incidental expenses	\$19,500 00
Printing and Stationary	5,500 00
Specific appropriations	4,500 00
Judiciary including Prosecutors	9,000 00
Probate Judges	2,500 00
Executive Officers	2,600 00
Adjutant and Quarter-master Generals	150 00
Contingent expenses	800 00
Wolf Scalps	700 00
State Library	100 00
State Prison	2,000 00
State House	7,500 00
	<u>64,850 00</u>

The public debt consists of the following liabilities of the Treasury, viz:

Estates without heirs	\$1,601 04
Conscientious Fines to be distributed	543 40
College Fund in the Treasury	6,532 50
Saline " " "	2,659 21
	<u>10,336 15</u>
Showing an excess of expenditure over the receipts, of	<u>75,186 15</u> <u>14,807 65</u>

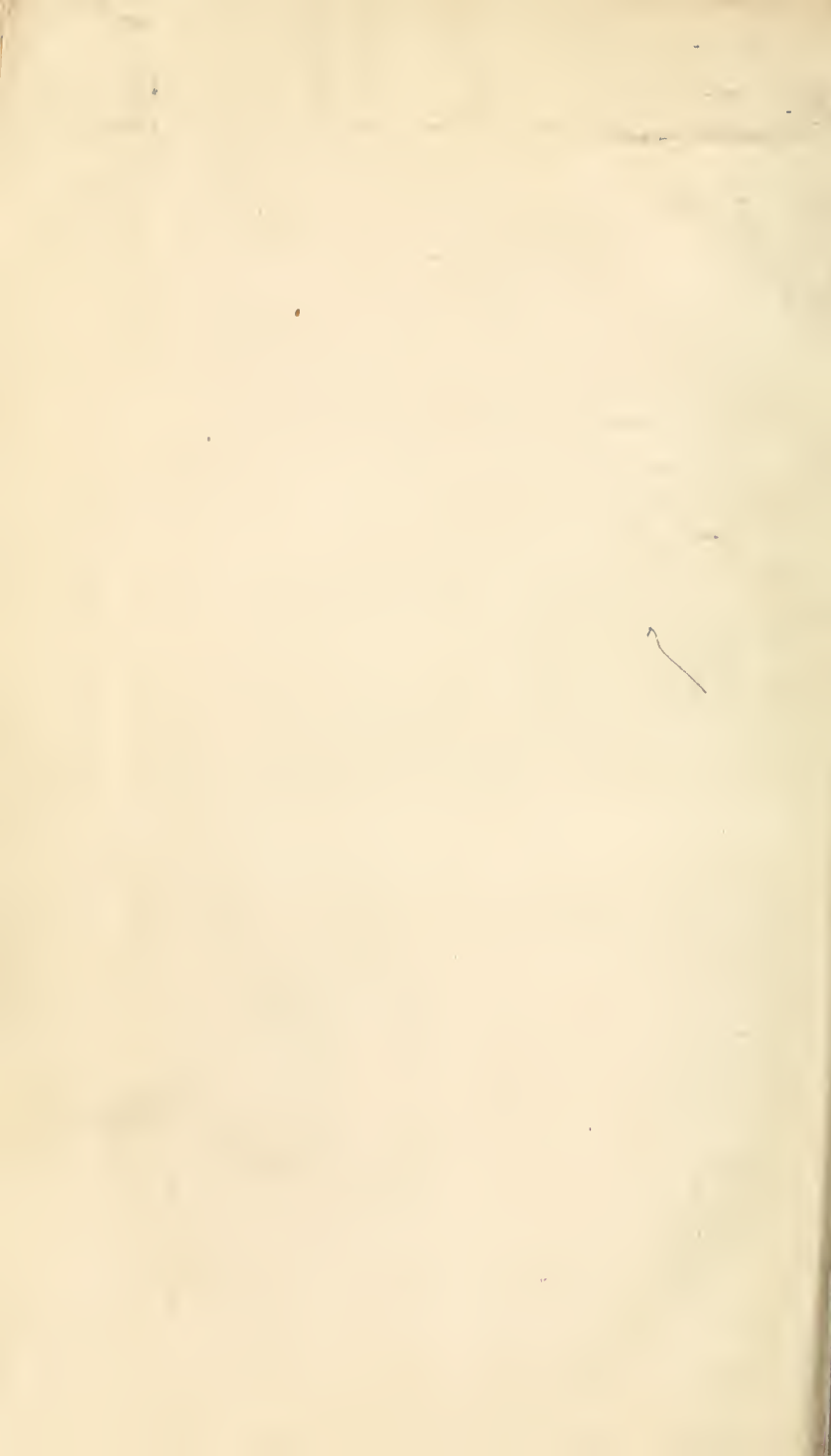




















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